

A publication
of the
Ontario Institute
for Studies
in Education

Ideas
about Teaching
and Learning

Volume 5, Number 2
April 1974

ORBIT 22





Vol. 5/No. 2/April 1974
A Publication of the Ontario
Institute for Studies in Education

ORBIT 22

Canadian Materials	Marilyn Kogon	3
Piaget in the Preschool: From Theory to Practice	Kenneth H. Rubin	4
How to Have a Better Science Fair	H. G. Hedges, L. A. Popp, and F. G. Robinson	8
L'évaluation du rendement des élèves franco-ontariens: D'où viennent les tests?	Dormer Ellis et Gerald R. Richards	10
The Unit Box Approach	Mitchell E. Batoff	12
Museum Activities in Schools	Edwina Taborsky	16
Distractible Children in the Grade I Classroom	Solveiga Miezeitis	17
Double O Zero		23
Secondary School Students and Teachers Look at the Personal Side of Education	Richard Lonetto	24
Teaching Aids from the Community – Cominco Ltd.		27
Profile of a School 24/Lord Elgin High School		28

Editor: Hugh Oliver
Assistant Editors: Jean Shapter, Catherine Cragg
Designer: Burton Kramer Associates Ltd

Cover: Photograph by Mitchell Batoff (See The
Unit Box Approach, p. 12)
Consultant Panel: W. R. Wees (Chairman)/J. Main/
D. Ellis/D. Hunt/F. Rainsberry, OISE

M. F. Grapko, Institute of Child Study
Miss F. Henderson, FWTAO
Mrs. C. Foisy-Moon, OECTA

Audience: *Orbit* is published by the Ontario Institute
for Studies in Education for everybody involved in
or concerned with education.

Content: *Orbit* features information about educa-
tional research and development and, in addition to
discussing work carried out by OISE and schools
across Ontario, draws on material from other
Canadian provinces and other countries. Les
articles qui intéressent surtout les francophones
paraissent en français.

Contributions: We should be glad to receive from
readers articles about educational practice,
criticisms of past issues of *Orbit*, and suggestions
for future issues. Before submitting full-length
articles, a preliminary letter should be sent to
the editor.

Indexing: *Orbit* is indexed in Current Index to
Journals in Education and Canadian Education
Index.

Subscription: \$3.00 per volume (5 Issues).
Not published in August. Available only to
subscribers; no individual copies for sale.
Subscriptions should be addressed to Publications
Sales, OISE, 252 Bloor Street West, Toronto,
Ontario M5S 1V6.
Please enclose a check or money order payable to
the Ontario Institute for Studies in Education.

Canadian Materials

Marilyn Kogon,
Zion Heights Junior High School

Where does a school librarian or teacher find out about new Canadian audiovisual items and books suitable for use in resource centers by students at a particular level? Before 1971 there were a few scattered sources (aside from publishers' catalogs) that did little more than notify us of the more popular titles. But with interest in Canadian study courses growing at all levels there came an increasingly obvious need for a comprehensive list to make us aware of the diversity and range of the entire output of educational and recreational materials by Canadian producers and publishers.

So in 1971 the Canadian School Library Association (CSLA), a division of the Canadian Library Association (CLA), reacted to this need by setting up the Canadian Materials Committee to produce an awareness list for school resource centers. Its first chairman, Irene McCordick, Master Teacher for Libraries in the York County Board of Education, recounts the thinking that led to the creation of *Canadian Materials*: 'The useful *Canadian Books for Schools* produced by the English Council and the School Library Council of the Alberta Teachers' Association was four years old. To update it, adding non-print materials, or to do a still more retrospective list, seemed massive undertakings. *Canadian Basic Books* was designed for the book trade, rather than for schools. Ontario's *Circular 15*, not then published, excluded some material by its requirement that manufacture be wholly in Canada, and seemed likely to be highly selective and closely related to Ontario curricula. It seemed that a need still remained which CSLA could meet, at least in part, by launching an annual listing of a somewhat different nature.'¹

This became *Canadian Materials 1971*. It included over 300 print and non-print materials suitable for school resource center collections (kindergarten to grade 12) produced in the calendar year 1971.² Each item listed bibliographic information, including price, grade level indicators, and a subject analysis, as well as a short annotation. All the organizing, compiling, and annotating was done by the 1971 Canadian Materials Committee – a group of volunteer school librarians and teachers.

While *Canadian Materials 1971* received financial assistance for its production

from the federal government through the Secretary of State as part of the International Book Year grants, it was hoped that future editions, prepared by (still more) willing volunteers, could be supported by sales. But the 1971 edition appeared in 1973 and sales were slow, because CLA had the difficult task of making school librarians across Canada aware of this new project just when the school year was winding down.

But librarians who did find and use *Canadian Materials 1971* were aware of its importance to the educational scheme. Ruth Marks, in her *Orbit* article of October 1973, states: 'Canadian reviews will come as the fruits of current educational research are applied to the Canadian context. The most recent publication about Canadian educational media is the Canadian Library Association's *Canadian Materials 1971*, which provides information about Canadian supplementary materials suitable for school libraries.'³ That's it – the one Canadian source for non-print materials. She goes on to list over 50 other sources from the United States and Great Britain.

Meanwhile the 1972 Canadian Materials Committee was hard at work under the chairmanship of Ralph Wintrob, Library Chairman, Zion Heights Junior High School in North York. From December 1972 to July 1973, Ralph and I (as assistant editor) tracked down leads for Canadian print and non-print materials copyrighted in 1972. We spoke to publishers' representatives, often repeating the same question – 'Why didn't you send us such and such for review? It's quite suitable for a school library.' We checked bibliographic data against other sources – *Canadian Books in Print* was the obvious choice for books, but over 200 books we reviewed were not in CBIP; the non-print materials could not be checked at all. We sent hundreds of items out to volunteer reviewers, and then waited for the reviews to trickle in. But it was worth it! *Canadian Materials 1972* appeared in December 1973 with the number of entries doubled from the previous year to over 750 items, representing the work of 115 producers across Canada.

'The lack of Canadian material for the Canadian student has long been decried as a national calamity. It has been reasonably easy to justify or rationalize that condition with rhetoric about the huge geographical separations, the small market potential, the purchasing patterns of school boards, and the massive media outpourings from the United States. *Canadian Materials 1971* should destroy much of that rationalization. A glance through these pages will illustrate dramatically that Canadian materials are being produced and are readily available. What has been missing in Canada was an organized definitive means of making these materials known to the Canadian educator.'⁴

Now it is available to school librarians and teachers across Canada. But the very fact that Canadian educational materials are increasing so rapidly is mitigating against the future of *Canadian Materials*. 'There's now too much for a group of willing volunteers to handle in their spare time. What's needed is a fulltime editor, and semi-annual publication. . . . The original grant has now been exhausted, and revenue from sales . . . has not been enough to support its continuation. . . . You don't have to be a militant nationalist to recognize the value of and need for a publication like *Canadian Materials*, and applaud its aims . . . it would be shameful if it were allowed to die.'⁵

Canadian Materials may be ordered from:
Canadian Library Association
151 Sparks Street
Ottawa, Ontario K1P 5E3
1972 edition, \$5.00; 1971 and 1972 editions together, \$6.50.

Footnotes:

1. Irene McCordick, *Canadian Materials 1971* (Ottawa: Canadian Library Association, 1973), p. v.
2. Government documents, textbooks, and French materials were omitted, but the hope was expressed to include them in future editions.
3. Ruth A. Marks, 'Where to Look for Reviews of Non-Print Educational Media,' *Orbit* 19 (October 1973), p. 7.
4. Don Hamilton, *Canadian Materials 1971*, p. iii.
5. William French, 'Before Dying,' *Globe and Mail*, January 22, 1973.

Piaget in the Preschool: From Theory to Practice

Kenneth H. Rubin,
University of Waterloo

During the past half-century, the theory and research of Jean Piaget and his Geneva associates have had far-reaching influences on contemporary psychological thought. Recent research in the field of child development based upon Piaget's theory has both verified and extended many of his original observations. However, it has only been during the last decade that efforts have been made to adapt various aspects of Piagetian theory to curriculum planning and teacher training. Perhaps this lag in assimilation is because his system is actually quite difficult to understand and does not readily lend itself to rapid integration with the traditional concerns of teachers. Moreover, 'if one looks carefully through Piaget's writings, one seldom, if ever, finds an attempt to deal with concrete problems of pedagogy' (Elkind, in Piaget, 1967, p. xvi). In the present article, I shall briefly outline Piaget's theory of cognitive development and then attempt to describe how the principles of the theory have been applied to the practical world of a Canadian compensatory prekindergarten program. [Readers interested in the philosophical background of Piaget's thinking are referred to the two-part article by Robbie Case in *Orbit* 14 and 15.]

Piaget's Theory: A Brief Outline

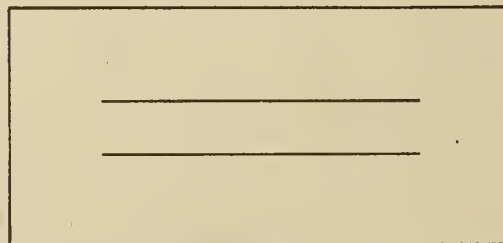
Fundamentally, Piaget has presented a stage theory, tracing the development of human knowledge from its roots in the earliest primitive reflexes of the infant to the complex formal thought of the adult. According to Piaget there are four major stages of cognitive development:

1. the sensorimotor stage (0-2 years);
2. the preoperational stage (2-7 years);
3. the concrete operations stage (7-11 years);
4. the formal operations stage (11 and up).

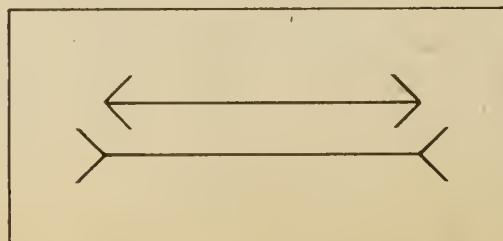
These stages form an invariant sequence: that is, there is a fixed order in which a child passes through each of the stages. While some children may proceed through the stages more rapidly than others, no child may skip a stage of development. Thus, there are individual differences in the *rate* of intellectual development but not in the *sequence* of development.

The child moves from less mature to more mature ways of thinking whenever his mental representations of external events lead to expectations that are not met. When this happens, the cognitive structures he has formed in the past are thrown out of balance, and the child finds himself in a state of *cognitive conflict*. Since this state of affairs is undesirable, the child tries to resolve his conflict by either fitting the new external event into already existing cognitive structures (*assimilation*) or forming a new mental structure to fit the external event (*accommodation*). Resolution of each conflict moves the child to a higher cognitive level. That is, with each imbalance and rebalance a higher state of development is reached.

Piaget also notes that each stage of development is characterized by the presence or absence of specific cognitive operations. The thought of the sensorimotor infant is *qualitatively* different from that of the preoperational child, or from that of the adult. Children draw very different conclusions from events than adults do. The preschool child, for example, is generally found to be in the preoperational stage of development, and his thought in this stage is characterized by his reliance on the way things appear at a given moment. That is, he is dominated by what he sees. For example, if lines of equal length are drawn so -



and then, once their equivalence has been established by the child, arrows are added to the lines *in the child's presence*, like this -



he will insist that the bottom line is longer. Thus, he tends to ignore his own previous knowledge and relies instead on his interpretation of immediate perceptions.

The preschool child is also unable to *decenter*: that is, he is unable to simultaneously consider more than a single aspect of an object or event. Thus, during social interaction, he is often egocentric, focusing only on his own point of view to the exclusion of the points of view of others. He finds it difficult to understand that other people perceive or feel things differently from the way he does.

The inability to decenter also underlies his failure to understand that quantities remain the same despite changes in appearance. For example, when water is poured from a short wide glass into a tall thin beaker the amount remains the same. But the preoperational child fails to consider height and width simultaneously and usually reports that the tall beaker has more water than the short glass from which the water was poured.

Finally, the lack of decentering skills leads the preschooler to misinterpret even the simplest of classification problems: he cannot see that he can be son and brother at the same time, or he cannot live in a city and in a country at the same time.

Another central characteristic of pre-operational thought is the inability of the child to mentally reverse operations. He finds it extremely difficult to realize that initial and final states are linked by an operation (such as pouring water into a tall beaker) that can be totally canceled out by a reverse operation (pouring the water from the tall beaker into the original container). This quality of pre-operational thought, when combined with the dominance of what is seen at the moment and the inability to decenter, accounts for much of the preschooler's failure to successfully solve problems in the logical and social realms.

Compensatory Education and Piaget

The question now becomes, how can one utilize Piaget's stage theory and the characteristics of preoperational thought in order to provide an effective educational experience for preschool children? First let me say that it should not be surprising that the enthusiasm elicited by Piaget's theory during the past decade has been paralleled by a cascade of interest in compensatory early childhood education. One of the major influences on the compensatory preschool movement has been the realization that early experience is of utmost importance to later intellectual growth and development. For example, Piaget believes that the intelligence of the adult is rooted in the infant's earliest adaptive responses to its environment. To Piaget, intelligent thinking develops as a result of the child's early actions upon and interactions with the environment. Cognitive structures develop through activities, and the greater the variety of situations to which the child must accommodate, the greater will be the foundations of logical thought.

Since disadvantaged children generally perform less well than middle-class children on measures of cognitive and social development when they first enter school, it may be that the early sensory and motor experiences that Piaget believes lay the foundation for later intellectual development have been insufficient in disadvantaged homes. As a result, these missed experiences may have to be compensated for during the preschool years. This line of thought has been echoed in Benjamin Bloom's belief that the rate of intellectual growth is at its point of highest acceleration during the first few years of life, and that the greatest payoff from environmental stimulation comes through experiences during the first four to six years.

Knowledge of the importance of early experiences has led numerous educators and psychologists to attempt to discover what kinds of activities should be offered to disadvantaged pre-

schoolers in order to aid their entrance into elementary school. The same people are also investigating various teaching strategies designed to optimally introduce these relevant educational experiences.

These two issues led Windsor Board of Education officials to seek help in establishing a trial preschool center in a core city public school. My own biases led me to believe that a Piagetian educational framework could provide a suitable basis for the project, and thus I am currently attempting to outline optimal teaching strategies and curriculum guides both in the Windsor preschool project and in the newly established University of Waterloo Early Childhood Education Center (which at this writing is but two weeks old). The Windsor project involves only disadvantaged children, but the Waterloo center includes both disadvantaged and advantaged.

My work in the development of these programs has been guided principally by the thinking of Kamii (1970), Weikart (1971), Lavatelli (1970), and Hooper (1972). (See 'Further Reading' below.) In the following sections I will outline how Piaget's theory has been applied.

Teacher Strategies

Central to applying Piaget's theory to education is the concept of the 'problem of the match' (Hunt, 1961). Drawn from Piaget's beliefs in the stage-like progression of cognitive development, the 'problem of the match' specifies that the ideal learning condition involves just the right amount of discrepancy between what a child knows and the problem he is faced with. Too simple a problem will only bore the child, whereas too difficult a problem may overwhelm or frustrate him. The optimal condition is one that confronts the child with the illogical nature of his point of view. Teacher-induced confrontation provokes cognitive conflicts, which the child seeks to reconcile, thereby producing new processes by which to adapt to new situations. Thus, 'matching' curriculum to the child's level of cognitive development is an optimal teaching strategy that would intrinsically motivate him to attain new logical skills.

Let me now give you a concrete example of what I mean. Burke-Murkle and Hooper (1973, p. 6) have shown that *seriation* skills develop in the following sequence:



The photographs were taken at the Piaget Preschool in Windsor



1. the ability to identify the larger and smaller of *pairs* of objects;
2. the ability to identify the same object as now large, now small, depending upon the size of simultaneously present objects;
3. the ability to apply relative comparisons in systematic fashion to each of a number of simultaneously present objects;
4. the ability to construct a one-to-one correspondence between two sequences of objects in which the elements of the sequences correspond because they have the same relative position in the sequence;
5. the ability to arrange objects in a sequence and then insert appropriately several more objects into the sequence;
6. the ability to arrange in a sequence a set of objects that differ in more than one attribute.

Now, let us say that the child is able to perform level 1, 2, and 3 seriation tasks but has increasing difficulty with level 4, 5, and 6 tasks. An 'optimal match' would be to introduce the child to level 4 tasks, which could include, for example, matching a series of dolls of graduated size with dolls' dresses of correspondingly graduated size.

Once children's levels of development have been ascertained, the teacher would present well-prepared lessons to small groups of children who vary slightly in their levels of conceptual skills. These small-group interactions allow the participants to hear opposing points of view concerning the material at hand. When children discuss concepts with other children whose levels



of conceptual development are higher than theirs, their own thoughts are often thrown into states of cognitive conflict. Within the lesson plan, the teacher's question format can motivate these 'cognitively unbalanced' children to seek and find higher operational levels.

Consider a lesson plan involving classification skills. The children are presented with 'attribute' blocks varying in color (red, yellow, and blue), shape (circles, triangles, and squares), and size (large and small). While the children look at the blocks, the teacher might ask a member of the group how two of the blocks are alike or different. The teacher might then ask the child to put all the blocks that are alike together. As the child proceeds in sorting the items the teacher may continue his non-cueing questions by asking, 'Where does this one go?' 'Does this one go here?' 'How do you know?' 'Is there another way to group the blocks?' After the first child has completed his grouping the remaining members of the group may be individually asked the same kind of questions. In addition to having them watch how other children group the objects, the teacher may induce discussions between the children that could lead them to understand that the objects can be classified in ways other than they had originally been aware of.

The non-directive method of questioning, fundamental to Piaget's theory, allows the child to discover answers for himself, and the conflict evoked by the varying responses of the group members serves to decrease his degree of egocentric thought.

The primary function of the teacher is that of catalyst; he provides the child with materials, poses the problem, watches, asks questions, and shares the enthusiasm and excitement of the children. As a curious observer he tries to help the child to crystallize and to extend his own ideas and discoveries

with open-ended questions – 'Why did you do that?' 'Can you do it another way?' or 'What would happen if—?' The key to this line of questioning is to give the child the responsibility for discovering things for himself. In this way the teacher can more effectively respond to the needs and progress of each individual child.

Program Goals

There are at present a number of Piaget-oriented preschool programs in Canada and the United States. A few, in fact, have formed the basis for commercially available material either in book form (Weikart et al., 1971) or in packages including teacher guides and curriculum materials (Lavatelli, 1970). The program I have been working with, both in the Windsor school system and at the Waterloo center, combines elements from these two programs and those of the University of Wisconsin Early Childhood Study Center (Dr. Frank Hooper, director) and the Pennsylvania State University Piaget program (Dr. Donald L. Peters, director).

Briefly, in accordance with Piaget's position that development is an active process of 'construction' of knowledge from inside the child, rather than passive 'absorption' of knowledge, the emphasis is to give both disadvantaged and advantaged children opportunities to attain concepts designed to help their entry into elementary school. The program goals fall into three general categories or content areas: social-emotional development, cognitive development, and psychomotor development.

Social-Emotional Development

This first content area concerns the child's ability to relate positively to other children and to develop self-management skills and a positive self-concept. Here are examples of the many explicitly stated social-emotional goals:

1. The child will verbally exchange information with others. (*interpersonal relations*)
2. The child will initiate verbal communication with others. (*interpersonal relations*)
3. The child will verbally identify the feelings of another person and state the cues that led to his identification. (*interpersonal relations*)
4. The child can verbally describe his feelings. (*self-concept*)
5. The child will verbally describe his abilities in positive terms. (*self-concept*)
6. The child will initiate new activities. (*self-management*)
7. The child abides by classroom rules on his own. (*self-management*)

Cognitive Development

The second content area divides into

three areas of knowledge: logico-mathematical knowledge, social knowledge, and physical knowledge.

Logico-mathematical knowledge concerns the relationships between objects in the child's environment. Children cannot be instructed in this area, but must construct their own knowledge. The three major categories of logico-mathematical knowledge include *classification* (grouping objects according to consistent criteria), *seriation* (ordering objects according to certain criteria), and elementary *number concepts* (one-to-one correspondence, conservation of number, cardinality and ordinality). Examples of the numerous behavioral objectives in the logico-mathematical area include:

1. Given a shape and the question 'Can you find one like this?' the child will find the same shape from an array of assorted shapes. (*pre-classification*)
2. The child will sort a group of objects into mutually exclusive groupings. (*classification*)
3. The child will arrange three objects in a graduated series. (*seriation*)
4. The child will give a verbal rationale for his series. (*seriation*)
5. When given a particular numeral and directions, the child will find objects equal to that number. (*number*)
6. The child can state that two pre-established sets of between three and five items are equivalent. (*number*)

Social knowledge is built on feedback received from people in the child's environment. It is man-made, arbitrary knowledge, not primarily based on logic. Examples would include the names of people and objects, or the behavior rules at home and in school. This is the one area in which it is acceptable to reinforce right answers and correct wrong answers.

Physical knowledge derives from discoveries made through repeated encounters with the natural environment. The child acts on objects and sees that these objects react in a regular manner. Some examples: If yellow and red paint are mixed, orange paint is the result. Balls bounce when dropped to the floor. Some objects are attracted to magnets and others are not. Wheels roll, but blocks do not.

Psychomotor Development

In the third content area the objectives of the program are met by presenting opportunities for developing large and small muscle coordination, balance, eye-hand coordination, and so on.

The Curriculum

The curriculum should closely match the objectives and the theoretical framework of the program. As Lavatelli notes, if one

accepts Piaget's theory that knowledge is acquired through action upon things and the relations that exist between them, then a major part of the preschool day should be reserved for free choice of activity. However, this should not be taken to mean that the children are responsible for planning the daily activities. Instead, my interpretation is that the children should be allowed to choose freely from among a number of specific teacher-planned daily activities.

Moreover, some of these activities should take the form of carefully planned, short, structured periods, during which the teacher meets with small groups of children and the focus is upon the three content areas of the program. What the teacher must do is have prepared, well in advance of the activity, a repertoire of lesson plans to correspond to particular levels of cognitive representation (from simple and concrete to complex and abstract) and levels of operation (sensorimotor or verbal). It is obvious that none of the lesson plans should present a concept to the children in a verbal, abstract fashion.

Choice of a large number of prepared lesson plans allows the teacher to 'match' a small-group activity to particular children in the classroom. In this way, teachers learn how structures develop and how to aid such development (Lavatelli, 1970). Moreover, once the lesson plans have been used for a while, teachers can evaluate each activity and offer suggestions for changes in the curriculum.

A further advantage of having written lesson plans on hand is that a teacher can allow an aide or volunteer to lead such a group. With the objectives of the lesson explicit and the question format clearly set forth, the teacher can feel confident that the aide is remaining 'true' to the Piagetian program. In our program, university student volunteers are able to obtain a copy of a lesson plan several days prior to their small-group presentation, and they can thus rehearse the question format and present the concept in a natural manner.

The lessons themselves are written according to the following format: (a) the concept to be presented; (b) the objectives for the teacher; (c) the objectives for the children; (d) the materials to be used; and (e) the procedure to be followed. Here is an example of a typical lesson plan.

Teacher: Linda

Area: Main room

Concept: Same and different

Objectives:

Teacher

1. to provide an opportunity for each child to discriminate between two objects that are the same and one object that is different on the basis of identity.
2. to encourage appropriate labeling of objects and explanations of sameness and difference.

Children

1. to point out the object that is different; to point out the two that are the same.
2. to appropriately label objects and explain choice of sameness and difference.
3. to place objects in appropriate boxes.

Materials:

- 2 identical dolls and 1 that is different
- 3 cardboard cards with 'happy' faces on 2 of the cards and a 'sad' face on 1 card
- 2 toy cars and 1 truck
- 2 round beads and 1 block
- 2 bowling pins and 1 ball
- 2 forks and 1 spoon
- 2 glasses and 1 cup
- 2 boots and 1 shoe
- 2 boxes

Procedure:

Present 3 dolls, introducing 2 as twins who want to receive the same things for their birthday. Explain that the children are to choose presents for the twins. Place the 'face' cards face down. Present the arrays of presents one at a time, each time placing the 2 objects that are the same on the 2 'happy' face cards and the different object on the 'sad' face card. Allow each child the opportunity to select the 2 that are the same and, in order to check the appropriateness of his answer, to turn up the cards under the 2 chosen objects (2 'happy' faces = correct answer; 1 'happy' and 1 'sad' face = incorrect answer). Ask the child if he can put the pair of objects into a box for the twins. The odd objects go into a second box. Ask each child to label all objects and to explain how they are the same or different.

At present, the Waterloo and Windsor programs have at least sixty explicitly outlined lesson plans and, of course, the numbers are ever increasing.

Further Reading

In the present article, I have attempted to outline how Piaget's cognitive developmental theory can be adapted to the educational world. For those readers who are interested in furthering their knowledge of Piaget's theory and its educational implications I have asterisked the titles below that have proven most helpful in my efforts to train the Windsor and Waterloo teachers.

Piaget's Theory

Flavell, J. H. *The Developmental Psychology of Jean Piaget*. New York: Van Nostrand, 1963.

Furth, H. *Piaget for Teachers*. Englewood Cliffs, N.J.: Prentice-Hall, 1970.*

Ginsburg, H., and Oppen, S. *Piaget's Theory of Intellectual Development*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.**

Piaget, J. *Six Psychological Studies*. D. Elkind (ed.). New York: Random House, 1967.

Singer, D. G. 'Piglet, Pooh, and Piaget.' *Psychology Today*, June 1972, pp. 71-96.*

Piaget and Education

Burke-Murkle, A., and Hooper, F. H. 'Logical Task Performing in the Preschool.' Paper presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, March 1973.

Hooper, F. H. 'An Evaluation of Logical Operations Instruction in the Preschool.' In R. K. Parker (ed.), *The Preschool in Action: Exploring Early Childhood Programs*. Boston: Allyn & Bacon, 1972.* (This book as a whole is highly recommended.)

Kamii, C. K. 'An Application of Piaget's Theory to the Conceptualization of a Preschool Curriculum. Also in *The Preschool in Action*.'**

Kamii, C. K. 'Piaget's Theory and Specific Instruction: A Response to Kohlberg and Bereiter.' *Interchange* 1 (1970), 33-39.

Kohlberg, L. 'Early Education: A Cognitive Developmental View.' *Child Development* 39 (1968), 1013-1062.

Lavatelli, C. S. *Piaget's Theory Applied to an Early Childhood Curriculum*. Boston: American Science and Engineering, 1970.**

Schwebel, M., and Raph, J. (eds.). *Piaget in the Classroom*. New York: Basic Books, 1973.

Sigel, I. E. 'The Piagetian System and the World of Education.' In D. Elkind and J. H. Flavell (eds.), *Studies in Cognitive Development*. New York: Oxford University Press, 1969.

Weikart, D. P., Rogers, L., Adcock, C., and McClelland, D. *The Cognitively Oriented Curriculum*. Washington: NAEYC Publications, 1971.**

Early Experience and Compensatory Education

The following two works are classics in the field:

Bloom, B. *Stability and Change in Human Characteristics*. New York: Wiley, 1964.

Hunt, J. McV. *Intelligence and Experience*. New York: Ronald Press, 1961.

How to Have a Better Science Fair

H. G. Hedges, L. A. Popp,
F. G. Robinson, OISE

Each year science fair committees, science teachers, and individual students ask us to give advice and make evaluations in connection with science fairs. Our experience has led us to some fairly explicit conclusions, which we would like to present here for your consideration.

Our purpose is not to criticize science fairs but to encourage their further expansion and improvement. Through collective service as judges of fairs at all levels – classroom, school, community, county, regional, provincial, and national – we have observed them extensively and feel that they have much educational value. Students, we find, are generally enthusiastic about them and organize their project preparation well.

Certain assumptions underlie the science fair movement, even though they are not always explicitly stated. These assumptions are:

- that the values of science fairs are educational rather than competitive and the benefits are shared by all participants and not merely by the winners;
- that the purpose of science fairs is to promote and encourage scientific thinking on the part of the participants;
- that the work going into a science fair is the work of the student involved, although it is recognized that there is merit in his having some advice from parents, teachers, scientists, and other appropriate persons;
- that there is consensus on the part of the judges, teachers, and students on the criteria for judging. Such criteria are usually concerned with originality, design, organization, neatness, clarity, and accuracy.

Criteria for a science fair should reflect the basic purposes, particularly the encouragement of scientific thinking. In this way, they guide the student in selecting and organizing his project and the judge in evaluating it. Therefore, the science fair committee's first requirement is to prepare a clear statement describing the possible levels of scientific activity that entries may represent and the criteria upon which they will be judged.

There are two important purposes served by identifying a levels system. First, it indicates to students that various levels of scientific intensity can be identified, and that in general projects at higher levels are more deserving of

recognition than those at lower levels. Second, it specifies the various levels to be used in categorizing the projects.

We propose the following five-level system as a means of differentiating among the various qualities of scientific investigation.

Level 1: *A diagram, copy, illustration, table, or other display of science information already available in printed or non-print material.* The most common level 1 exhibits are enlargements of tables or diagrams from magazines or science books, or commercial models assembled by the students. Typical examples would be a chart of the life cycle of an insect; a chart illustrating the operation of a dry cell; a standard diagram of the solar system accompanied by a table of information on distance, size, length of year, and temperature; and a cross-section of plant or animal material. The student has not developed a novel presentation of the information, nor has he brought together a number of interrelated diagrams or displays on the topic. He has basically selected and reproduced – perhaps with some refinement or modification – material that is generally available.

Level 2: *A chart, illustration, model, collection, specimen, or report based on firsthand investigation by the student.* The vital criterion for this level is that unmistakable evidence of the student's own thought must be apparent in the data, organization, interpretation, or reporting. If the project deals mainly with information already available, it must show novelty of treatment or organization. A very wide range of projects fall into this category. Examples: a report on the care of one or more live specimens, either plant or animal; an unsystematic collection of specimens in a broad classification such as insects or leaves; a display of topical photographs taken by the student; a chart recording the amount of rainfall for a period of time; a student's own static model of the solar system, a rocket, or a building; a diorama showing a typical environment of a plant or animal; a map, chart, life cycle, or similar material. In each case there is clear evidence that the student actually made a contribution rather than merely copying information from a standard reference.

Level 3: *A working model based on an understanding of a scientific principle.*

At this level, projects range from replications of standard classroom experiments (with or without improvements) to working models, in each case showing that the student understands the principle involved. A demonstration of an experimental effect also fits into this category. Examples: a working model of a device such as a fuse breaker or a telegraph key; a demonstration of the conversion of energy from one form to another; a home-made thermometer; a fairly complex working system, such as a home-made incubator, in which more than one scientific principle may be demonstrated. Generally speaking, if a student has developed or invented a new application of a principle or a new working device, his project qualifies for this level, but obviously it merits a high rating on other criteria such as originality.

Level 4: *An attempt to answer a question by designing and conducting an experiment or correlational study in which one or more variables undergo testing, but in which circumstances or lack of knowledge prevents adequate control of significant independent variables.* The aim of the project should be to discover a cause-and-effect relationship between two phenomena or sets of phenomena. The test for this level (as compared with level 5) is whether all the important variables are controlled. Typical examples: measurement of the effect of a particular environment on plant growth (without controlling such variables as soil, water, sunlight, and temperature); measurement of the effect of temperature on mealworms (without controlling light, moisture, etc.); a study designed to determine whether varying the length of a column of air in a bottle affects the pitch (without controlling the type or shape of bottle used); or a comparison of the effect of one dietary component on rats (without adequately matching the rats and controlling other variables).

Level 5: *An attempt to answer a question by designing and conducting an experiment or correlational study in which all the important competing variables are controlled.* Although projects at this level are relatively rare at science fairs, they represent a peak in scientific work and should be encouraged. To qualify for this level, a project must meet two main criteria: (a) the experiment will be controlled to the point where alternative explanations of the effect can be ruled out; and (b) the student will show an

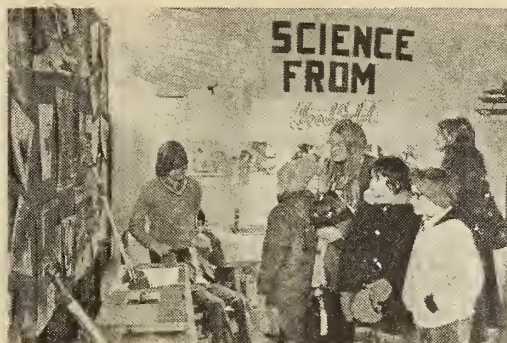
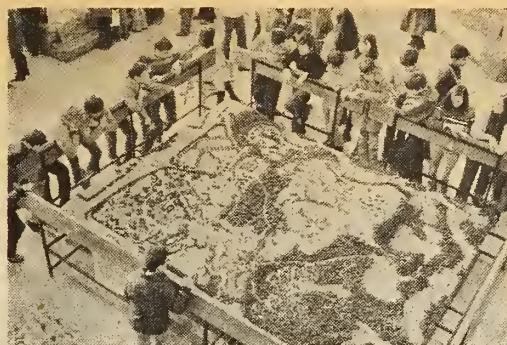
understanding of the logic of the methodology involved (e.g., how the effects of specified competing variables were eliminated) and of the interpretation of the result (e.g., why the result cannot be attributed to error or chance factor). In most cases, charts or graphs of data will be available for examination. A novel approach to a standard classroom experiment, if the other criteria are met, qualifies for this level. If a problem is identified and the variables adequately treated, it is not essential that significant positive findings result from the project; it must be recognized that the design rather than the results qualifies a project for this level. Outstanding examples of level 5 projects that we have observed are a carefully controlled dietary study of the growth of rats, a study correlating the kinds and numbers of snails in various places in a river with the amount of pollution in each area, and a study of the effects of chemicals on colors of ceramic glazes.

These five levels can be given recognition by a differential awarding of basal points. For example, it might be decided that level 1 projects should have a basal rating of 5, level 2 of 10, level 3 of 15, level 4 of 20, and level 5 of 25. Then up to 75 merit points can be awarded by the judges in accordance with the other criteria agreed upon, and the final score for any project will be expressed as so many points out of 100. Thus, while higher-level projects carry a bonus, it is still possible for outstanding examples of lower-level projects to receive greater scores than average projects at higher levels.

In addition to specifying levels of science activity, we recommend that science fair planning committees consider the following suggestions, which have arisen from our observations and discussions.

1. Students should be made aware of the basic purposes of science fairs and, more particularly, informed of the criteria to be employed in judging. Our discussions with students have frequently revealed that they were not aware of criteria that would undoubtedly have led to better selection, design, and presentation of their projects. It is important that information about criteria be provided at the outset so that students can investigate the various levels before selecting a project.

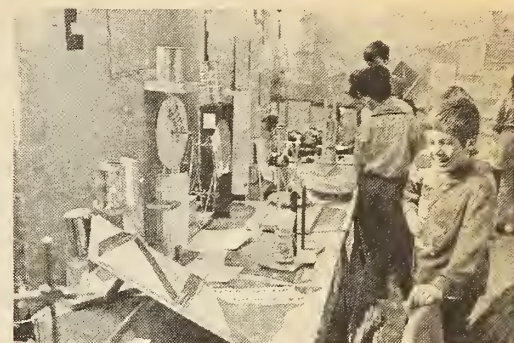
2. There should be a clear understanding of the amount of outside help students are permitted to receive. The usual criteria do not put enough emphasis on what might be termed 'independent effort.' Since assessing the amount of independent effort is a difficult task for the judges, we suggest that a statement



be attached to each project. This statement should be signed by the student and his teacher and should indicate the source of the idea for the project, the student's actual contribution to its development, and the contributions made by the teacher, parents, or others. At the present time there appear to be no guidelines on help from other people, and in the past some highly rated projects have benefited from substantial input from adults. An acceptable guideline would be to allow a small amount of consultation at the original planning stage, but no outside help at the stages of data collection, interpretation, and presentation. Consultation at the planning stage should be limited to helping the student improve the planning of the project he himself has chosen, and should not directly influence his choice, his search for sources of information, or the eventual construction or display of the project.

3. The committee should ensure that the judges agree in their understanding of the criteria and follow them as rigorously as possible. Otherwise a very neat, a very attractive, or a spectacular project may receive a higher rating than it deserves because of a judge's particular bias. Similarly, the judging should not reflect the appeal that certain of the projects may have for visitors – such as spectacular working models or projects involving pets.

4. A clear indication of the total amount of work that the student has invested in the project should be available to the judges. Sometimes projects involving a great deal of work are not spectacular and the amount of effort put into them is not recognized. This is particularly true of projects for which data are collected over long periods of time.



5. Most science fairs include entries that fall under the heading of social studies or sociology – projects such as models of villages, maps showing population densities, studies of voting patterns, and family trees. If the judges are accustomed to thinking in terms of the physical and biological sciences, many of the entries will get less recognition than they deserve. We suggest that a separate category for social and behavioral sciences be established and a person qualified to assess the value of these entries be added to the panel of judges.

6. Steps should be taken to provide feedback to contestants. In most science fairs the lack of feedback is a major weakness. Adjudication of the sort given at music festivals is valuable to contestants, and we suggest that a similar system be adopted by science fairs. In the past, the small number of judges, the many projects, and the limited time allowed for judging have tended to prevent adequate evaluation and discussion with the student. For this reason, we suggest that the number of judges be large enough so that an individual rating sheet can be completed for each project and given to the contestant. In addition, if possible, each contestant should have an interview with a judge, who will discuss his project, point out its merits, and suggest improvements that might be made. The ideal arrangement is to have the contestants present during and after the judging so that the judges' comments may be communicated to them immediately.

We believe that if science fair committees are guided by these suggestions, the major goals of science fairs will be more fully realized, gradual improvement of entries will be ensured, and broader student involvement will result.

L'évaluation du rendement des élèves franco-ontariens: D'où viennent les tests?

Dormer Ellis et
Gerald R. Richards, OISE



L'emplacement des écoles participantes

Quand les responsables des écoles ontariennes pour les élèves d'expression française se réunissent, un souci revient fréquemment: la pénurie de tests de rendement convenables pour leurs élèves. Les enseignants et les directeurs voudraient bien avoir des moyens pour évaluer le niveau des enfants qui fréquentent leurs écoles.

Bien que les éducateurs du secteur anglais aient à leur disposition un éventail de tests de rendement dans toutes les matières et à n'importe quel niveau, publié soit au Canada, soit aux États-Unis, leurs confrères francophones trou-

vent ces tests inutiles. Sans doute, ils pourraient traduire ces tests. Malheureusement ça ne marche pas. Il est presque impossible de traduire un test de rendement sans changer le niveau de difficulté des questions. Bien sûr, les Québécois utilisent certains tests composés dans leur province. Cependant, les différences dans les programmes d'études rendent ces tests inutilisables pour les écoles ontariennes. Il en est de même, des tests qui viennent des pays francophones. Mais un autre problème jaillit: comment peut-on interpréter de façon intelligente les résultats de tels tests? On aurait besoin de normes empiriques ontariennes. Or celles-ci n'existent pas.

Les seules exceptions sont certains tests de rendement portant sur les connaissances de la langue française et anglaise, pour lesquels des normes

basées sur un échantillon typique de six mille enfants franco-ontariens, choisis au hasard, furent construites en 1973 par Dormer Ellis et W. G. Fleming de l'OISE. (Voir *Orbit* 19, octobre 1973, pp. 12-13.) Ces professeurs sont codirecteurs d'un projet de recherche intitulé *Une étude des caractéristiques et des besoins des élèves franco-ontariens*, qui est subventionné par le Ministère. Le comité consultatif de ce projet voulait évaluer aussi d'autres matières du programme d'études. Par conséquent, on a décidé de construire des tests en mathématiques et en études sociales destinés aux élèves des classes de 3^{ième} et de 6^{ième}.

Pour construire ces tests, on a besoin d'items axés sur le programme d'études ontarien et au juste niveau de difficulté. D'où viennent de tels items? Il faut partir de rien. Chose peu facile à faire. Pour commencer, on dresse une longue liste d'items provisoires recueillis de diverses sources. Naturellement, on consulte les programmes-cadres du Ministère; on regarde les manuels scolaires autorisés. Pendant l'année scolaire 1971/72, une étudiante diplômée d'expression française était engagée à temps partiel pour formuler des items fondés sur ces deux sources. Les examens préparés par les instituteurs pour leurs propres élèves sont une autre source précieuse. Au printemps 1972 quelques directeurs d'école ont eu l'obligeance d'envoyer aux codirecteurs du projet certains exemples des examens utilisés par leurs instituteurs. Ces questions servaient comme base aux items objectifs pour les tests en études sociales et en mathématiques. Les idées-clés d'autres items ont été tirées des tests standardisés destinés aux élèves anglophones. De plus, on consulte les professeurs des écoles normales.

De ces sources, bien des items provisoires sont tirés. Puisque beaucoup d'items se montreront inadéquats, il faut ne pas terminer la cueillette des items juste au moment où l'on arrive à la quantité visée par la version finale du test. Si on envisage un test qui comprend vingt-cinq items, on doit en mettre à l'épreuve au moins une centaine.

Quand il y a assez d'items provisoires, des experts doivent les évaluer du point de vue de la compréhension et du contenu. Qui sont ces experts? Les titulaires de classe sont les mieux préparés à indiquer si leurs élèves pourraient comprendre tel ou tel item, et à déterminer si le contenu correspond d'une manière précise à ce qui est enseigné à ce niveau. La critique du contenu a été faite de bon gré par une douzaine d'instituteurs venant des quatre coins de la province: Cornwall, Ottawa, Timmins, Toronto, Welland et Windsor.

Une autre espèce d'évaluation peut se présenter en même temps. Chaque item proposé doit être jugé d'après sa construction technique. A ce moment-là, on fait appel à des spécialistes de l'OISE. Par exemple, il faut que les réponses parmi lesquelles les élèves doivent en choisir une, aient la même forme grammaticale et soient à peu près de la même longueur. Bien sûr, il n'y a qu'une réponse correcte et les autres réponses

sont nettement fausses. Aussi, on veut que la bonne réponse se trouve au hasard parmi les réponses. Ces deux aspects de l'évaluation furent achevés avant la fin de juin 1972.

Il s'agit ensuite de préparer deux ou trois versions préliminaires de chaque test. Les seuls items employés sont ceux que les groupes d'instituteurs et de spécialistes considèrent acceptables. Les items sont distribués au hasard parmi les versions. Par exemple, le test de rendement en mathématiques, destiné aux élèves de la 3^{ème} année, avait trois versions, A, B et C, disposant chacune de vingt-cinq items. Il n'y avait que deux versions de tests en études sociales. Moins d'items en études sociales qu'en mathématiques sont restés après ce criblage. Il est fort difficile de formuler les phrases, de façon qu'elles soient correctes ou fausses sans équivoque. Là-dessus, les instituteurs ont du mal à se mettre d'accord. De temps en temps, ce qui est enseigné dans une école ou une région de la province, ne l'est pas ailleurs.

En automne 1972, les versions préliminaires des tests de rendement en mathématiques et en études sociales ont été mises à l'épreuve dans un nombre restreint de classes des Conseils de Carleton, Niagara Sud, Ottawa et Stormont, Dundas et Glengarry. Les chercheurs sont très reconnaissants envers les directeurs qui ont permis à leurs élèves de participer à l'épreuve de ces versions préliminaires.

Ensuite, on passe à l'analyse statistique des réponses données par les élèves à chaque item. Toutes les réponses d'un élève sont transcrites sur une carte perforée d'ordinateur. Ces cartes permettent à l'ordinateur de donner pour chaque item les renseignements suivants: le niveau de difficulté, c'est-à-dire, la proportion d'élèves qui a choisi la réponse correcte; 'l'attrait' de chacune des réponses fausses; et la corrélation entre cet item et le test en entier.

Lorsqu'on est en train de sélectionner les items pour la version définitive d'un test, on examine l'analyse statistique de chaque item des versions préliminaires. Pour un item idéal, la réponse correcte doit être choisie par cinquante pour cent des élèves et, aussi, le cinquante pour cent qui restent doivent être partagés également par les fausses réponses. En plus, il est souhaitable que les élèves qui reçoivent les meilleurs notes sur le test en entier répondent correctement à cet item. C'est très rare qu'on trouve un item parfait par rapport à toutes ces qualités. On utilise donc les items qui approchent le plus de la perfection.

Les versions définitives des tests de rendement en mathématiques et en études sociales furent disponibles en mars 1973. En 3^{ème} année et en 6^{ème} année, le test en mathématiques comprenait vingt-cinq items. Le test en études sociales en 3^{ème} se composait de trente items, et en 6^{ème}, de quarante.

Voilà pour les tests! Cependant, il va de soi qu'il faut avoir des normes empiriques avant qu'on ne puisse s'en servir. Pour arriver à ces normes, on fait passer chaque test à un échantillon typique d'élèves franco-ontariens. Quatre mille élèves y ont participé au printemps 1973. Les écoles qu'ils fréquentent se trouvent aux endroits indiqués sur la carte. Comme le lecteur peut le constater, toutes les régions où demeurent des franco-ontariens sont incluses dans le sondage.

En été 1973, les chercheurs ont envoyé au directeur de chaque école participante, les notes de ses propres élèves, les mesures sommaires de son école et les normes ontariennes. Ces normes comprennent le rang centile de chaque score brut et les stanines. C'était une étape importante.

Le rang centile est un pourcentage de sujets, celui qu'on trouve au-dessous d'un score donné. Par exemple, si un score brut avait un rang centile de 70, l'élève qui obtient ce score surpasserait 70 pour cent des élèves ontariens. Et si l'on ordonne les scores bruts, de plus élevé au plus bas, et si ensuite on les divise en neuf groupes, d'après des pourcentages établis par un procédé statistique, le résultat est les stanines. En général, le stanine 1 indique un score très faible; le stanine 9 un score très fort; et le stanine 5 représente un score moyen.

Pour la première fois, on a fait des normes provinciales d'un test construit spécialement pour les élèves franco-ontariens. On voudrait bien avoir de tels tests dans toutes les matières et à tous les niveaux. Puisqu'il n'y a que le premier pas qui coûte, les chercheurs vont continuer à développer des tests de rendement pour les élèves franco-ontariens. Pendant l'année scolaire 1973/74, l'équipe Ellis-Fleming travaille avec leurs collaborateurs dans les écoles françaises sur des tests en mathématiques et en études sociales pour les élèves de la 4^{ème} année et de la 7^{ème}.

THE UNIT BOX APPROACH

A Novel Facet of Elementary School
Science Teacher Preparation

Mitchell E. Batoff
Jersey City State College

The unit box is a seminal development in elementary school teacher preparation. Its construction is the principal assignment in a science methods course evolved by the author over a five-year period at Jersey City State College.

Each student in the course assembles an inquiry-oriented, materials-centered, multimedia unit package. Its core is a commercially available unit of study that has been tested in the classroom; units of a modular nature are used and may be teaching units, resource units, or quasi-resource units. Students put their boxes together outside of class in the five- or six-week period preceding their student teaching and use them during their teaching assignment. Where the methods course is taught in the schools, unit box preparation is concurrent with apprentice teaching. In either case, the box enables students to do with children the kinds of teaching-learning they experience in their methods course.

The unit box is a novel approach, and in the author's methods course at Jersey City State College it has replaced the writing of science units – a widespread practice for which elementary education students generally are ill prepared. The thrust of the approach is the implementation of the unit around which the box is built. Students are asked to start with the teacher's guide to a good existing module and to bring together all the concrete materials (each item in sets of 16 or 32), all the supportive audiovisual materials,

and all the printed or other matter needed to teach the unit effectively. Great emphasis is placed on getting appropriate concrete manipulative materials in adequate quantities so that all the children can handle them, for the focus of the approach is on learning rather than teaching.

Each box is not only a multimedia but also a multisensory and multilevel package of instructional materials and strategies intended for in-depth use over a period of four to eight weeks or longer. Each one is custom made by the apprentice teacher, and he owns and uses it. Its purpose is to actively involve children and teachers in investigations of a unit of study chosen from the geophysical or biological sciences, and in the process to assist in developing the skills of observation, classification, measurement, sampling, extrapolation, communication, number use, inference, and the like. Some topics also facilitate the development of motor skills.

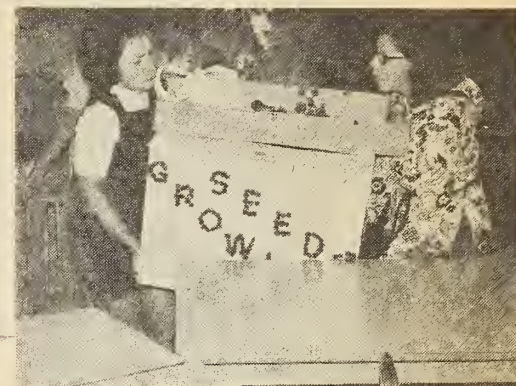
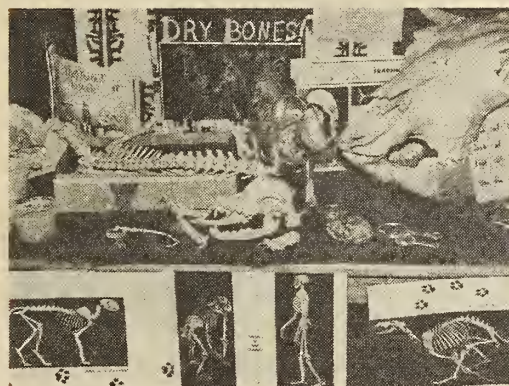
A unit box consists of the following:

1. one or more related teacher's guides used as a starting point
2. manipulative materials for each pupil
3. a set of record sheets or work sheets for pupils
4. a tape cassette and associated work sheets
5. a set of overhead transparencies
6. books for pupils and teacher
7. a set of vocabulary cards
8. a construction project to provide enrichment
9. thoughtfully considered evaluation devices
10. a large sturdy box, smaller containers, and a file – all labeled and organized.

The boxes may contain a wide variety of other instructional materials – large pictures, charts, science learning games, slides, task cards with information on field or museum trips appropriate to the unit, and a teacher-made filmstrip. Manipulative-investigative materials in classroom quantities are the essential part of the unit box, but a few demonstration articles may be included singly or in small numbers.

Why provide material in quantity? Scientific investigation involves experiences in search of meaning; teaching that gives excitement and pertinency to learning affords direct exposure to phenomena. For these, materials are needed. The unit box approach seeks to involve each pupil in a search for first-hand evidence by providing concrete materials in a 'wet laboratory' situation. This is a mandatory condition for teaching children – a compelling reason for placing emphasis on materials.

Where and how do students obtain all these materials? They are obtained from diverse sources and by various means. Some the students build, others they improvise from discarded bits and pieces, and a great many they have to buy. But a concerted search has produced an ever-expanding list of free and low-cost material. Each semester it becomes easier for students to obtain classroom quantities of such items as magnifying lenses, Celsius thermometers, fifty-cent cameras, compasses, magnets, and live butterflies.



What are some of the values of this approach? The emphasis on making and collecting items involves students in using materials and living organisms in inquiry teaching. But, as several science educators have suggested, one of the most valuable outcomes may prove to be the experience of producing the kit. The student scrounges, improvises, builds, assembles, shops, orders from catalogs, 'debugs,' and creates tangible objects; he reads and builds a library of books and pamphlets, uses audiotape cassettes, makes overhead projectuals, previews films and filmstrips, produces films, loops, slides, task cards, vocabulary cards, and learning games; he designs, organizes, and tests manipulative materials and print media of all sorts, visits places, and explores phenomena. In short, he undergoes a very broad and practical learning experience.

How and where does the student begin? He is exposed to a wide variety of teacher's guides to modules in the first session of the methods course. At that time, he has a chance to look over more than a hundred units available on campus and to collect printed descriptions of several hundred teacher's guides. After consultation with his cooperating teacher, he selects a unit around which to build his box. His choice is influenced by his background and inclinations, the science curriculum and texts used in the school to which he is assigned, and

suggestions his instructor makes on the strength of past experience with the units. Students are urged to choose a topic in which they can become deeply involved and around which they can build an enthusiastic classroom experience. A central purpose of the unit box approach is to have each apprentice teacher acquire a depth of knowledge in a particular area through firsthand experience, and to develop expertise in exploring and teaching it. It is desirable that each student teacher pursue a different topic, since both he and the children learn more if a wide variety of units are handled by the class.

What are the sources of teacher's guides and resource units for the unit boxes? To date, there are four main sources: the Elementary Science Study (ESS); the modular Experiences in Science Units (EIS) created and tested by Tannenbaum and Stillman; the Science Curriculum Improvement Study (SCIS); and the pre-primary *Sense and Tell* created and tested by Marshall, Podendorf, Swartz, and Shoresman. In addition, a number of successful unit boxes have been assembled using Minnesota Mathematics and Science Teaching Project (MINNEMAST) units, the mini-unit suggestions in *Guppies, Bubbles, and Vibrating Objects* by John McGavack and Donald P. LaSalle, and the Kitchen Photography unit developed at the Ontario Ministry of Education 1972 summer workshop. These seven sources offer the student teacher 159 choices of units in science and mathematics and six different formats in teacher's guides. The latter vary in sequencing suggested, in statement of objectives, and in amount of background information given. Since research has

not shown that any one program or type of teacher's guide is generally superior to all others, the apprentice teacher should be given an opportunity to choose one that he finds personally appealing.

A great variety of unit modules are available from sources not listed above, but these are for the most part less accessible and not so well tested in the classroom. Currently under review as additional starting points for unit boxes are the following: Science 5/13 from England; BEBCO Guides developed in Maryland; Examining Your Environment (EYE) developed in Ontario; University of Illinois project in elementary school mathematics and science (UICSM); Individualized Science (IS) modules; Science Inquiry Project Series (quasi-resource units); ASEP modules being developed in Australia; SCOPES units under development at the University of Northern Iowa; units developed for the African Primary Science Program; ESCS units from Memorial University, Newfoundland; and pollution control units developed in a project in Union, New Jersey. In addition to being used at Jersey City State College, guides for



some of these were used in the Unit Box Project conducted for the Ontario Ministry of Education in the summers of 1972 and 1973 at Owen Sound and Ottawa respectively. It should perhaps be noted that 'Science - A Process Approach,' the printed exercises developed by the Commission on Science Education of the American Association for the Advancement of Science, does not seem to lend itself to the unit box approach.

Where and how do the students obtain the teacher's guides? Guides for each modular unit are obtained through the college bookstore, from the publishers, and, in some cases, from the professor. Ever since the unit box was introduced in 1969, the ordering of units through the college bookstore has taken considerable time. A half-yearly inventory of supply is taken and units are reordered each semester. Teacher's guides are ordered in numbers varying from four to forty depending on the title. The Curriculum Materials Center has a full collection of ESS, EIS, SCIS, EYE, BEBCO, UICSM, Science 5/13, and MINNEMAST teacher's guides, and similar sets are on

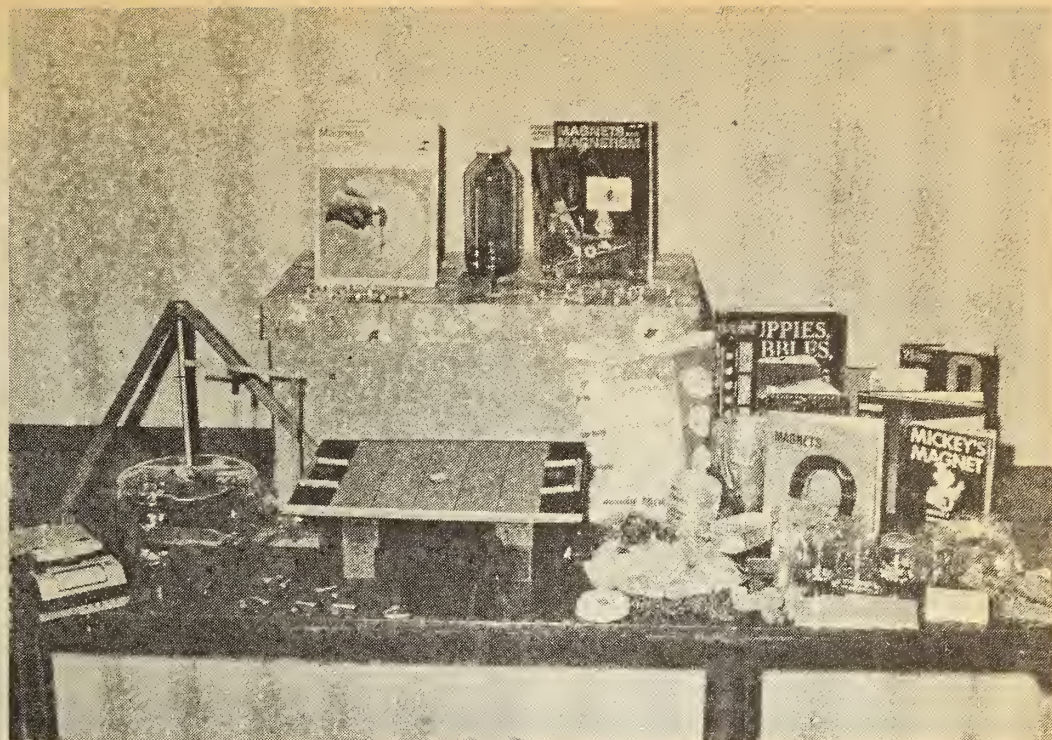
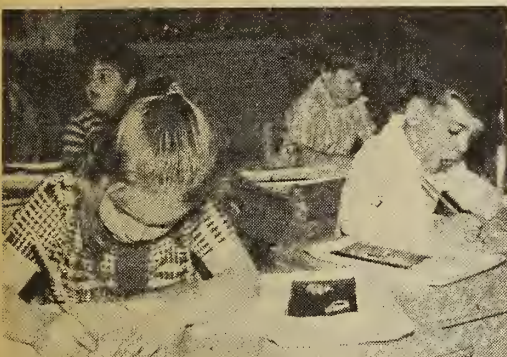
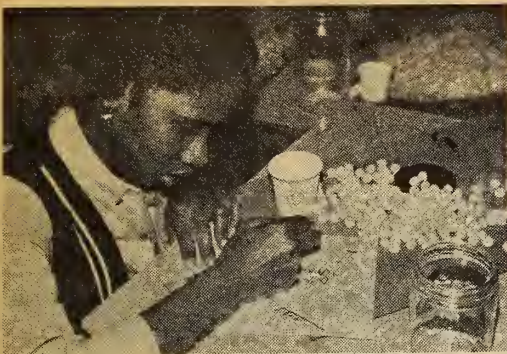
reserve in the college library at Jersey City State College. Thus, in addition to seeing the guides briefly at the first class session, students can examine them in the Curriculum Materials Center or borrow them from the library before making their choice. It is important to get the selection of teacher's guides into students' hands as quickly as possible both for viewing and purchase.

At the conclusion of the methods course on campus or the program in the schools, each student brings in his completed unit box and everyone has an opportunity to see all the boxes. Large open-house displays may be set up in the gymnasium or cafeteria to give the boxes more exposure, and such displays at Jersey City State College and in Ontario have attracted hundreds of viewers and engendered a valuable cross-fertilization of ideas among the students involved and between teacher and students. A twenty-minute conference is held with each student.

Ideally, the apprentice teachers have an opportunity to use their unit boxes and see their efforts come to fruition during their practice teaching experience. An assessment of what they actually do in science in the classroom is made through classroom visits and is part of a follow-up study of the unit box approach that will be published in 1974/75. To date, the study has included well over six hundred classroom visits and nearly seven hundred interviews.

As of January 1974, 733 unit boxes have been assembled over a ten-semester period at Jersey City State College. The boxes were prepared by majors in early childhood, general elementary, and special education for grade levels from prekindergarten through grade 8; by day students and evening students; by pre-service students and teachers in service; by undergraduates and graduates. Most of the boxes centered on topics in the physical and biological sciences. Some, however, were interdisciplinary or mathematics-oriented. Students enrolled in the Ontario Ministry of Education certificate program in elementary school science produced 104 boxes in 1972 and 39 boxes in 1973.

In summary, the unit box is a teaching-learning system that interlocks materials and other media with the development of concepts, intellectual process skills, pupils' self-image, language facility, and desired attitudes toward school and science and - above all - toward learning. Organization and disciplined freedom are key elements in its use, and its success depends on the teacher's skill in handling the contents effectively.



An earlier version of this paper and the project described herein was honored by the National Science Teachers Association and American Gas Association through a STAR (Science Teaching Achievement Recognition) Award for 1973.

For the guidance of participants in the Ontario Ministry of Education Summer Science Program at Owen Sound in 1972, Professor Batoff prepared a booklet titled 'Six Tips on Getting Started and for Getting the Most out of Your Unit Box Experience.' Highlights from the booklet follow.

1. Look over all the printed items given to you on units. Make a note of those that interest you.
2. Select the topic and/or teacher's guide that you want to use as the nucleus of your unit box.
3. Obtain the teacher's guide of your choice as soon as possible and read it. You may find it useful to purchase several guides on your topic to supplement the approach of your basic choice.
4. Begin collecting material to implement the teacher's guide you have chosen. Study the guide to determine how each suggested item is used and for what purpose. By so doing, you will be able to determine which items you can improvise, scrounge, or in some other way

obtain free or inexpensively to achieve the desired objective. In searching for materials in quantity, try these sources: your basement, kitchen, garage, attic, the local drug store, five-and-dime, hobby shop, grocery, hardware store, junk shop. In your search, always mention that you are a teacher. Check the yellow pages of the telephone directory for suppliers of materials you need; look for wholesalers, importers, distributors, and manufacturers. The closer you get to the source, the cheaper the item will be. A large manufacturer may well give you 30 to 50 of an article free. The British Columbia Department of Education Curriculum Guide to Elementary Science provides a list of Canadian suppliers for many units and materials. Check with other provinces to see if they publish similar lists. A good source of relatively inexpensive, high-quality science and math items is Select Elementary Teaching Supplies Company (SETSCO), 1315 West 71st Street, Vancouver 14, British Columbia. Another source you might investigate is Economy Wholesale, 250 McPhillips Street, Winnipeg, Manitoba R3E 2K4. Before buying anything, think, improvise, construct, scrounge, beg, or borrow, but aim for maximum pupil involvement in each activity of the unit by trying to provide class sets of as many items as possible.

5. Before you go back to the classroom, start exploring. Use the material you have collected to conduct mini-investigations of phenomena dealt with in the unit. Engage in as many 'hands-on' activities with your materials as you can before using them with your pupils.

6. Organize your materials in labeled containers and put them in a sturdy box (or boxes). This is your unit box. Organize all your printed items in an accordion file in the box. Remember, materials are useless unless they are accessible and in working order. Continue to study the teacher's guide, supplementary books, and other printed materials accumulated on your topic. Continue to add useful materials and other media software to your box to make it as complete as possible before you return to the classroom. Use your materials to investigate phenomena, before teaching the unit and with your pupils when you use the unit box at school.

Note: For the convenience of interested readers, we hope to publish an annotated bibliography/directory of the curriculum projects and publishers referred to in 'The Unit Box Approach' in *Orbit* 23, June 1974. We regret that it is not possible to present it at this time.

Museum Activities in Schools

Edwina Taborsky,
Department of Museology,
Royal Ontario Museum

With the growth of different educational styles, and concern even over the validity of education itself, teachers are taking serious note of experiments attempting to open up the school environment and to tie it in with the daily reality of their students both at home and in the community.

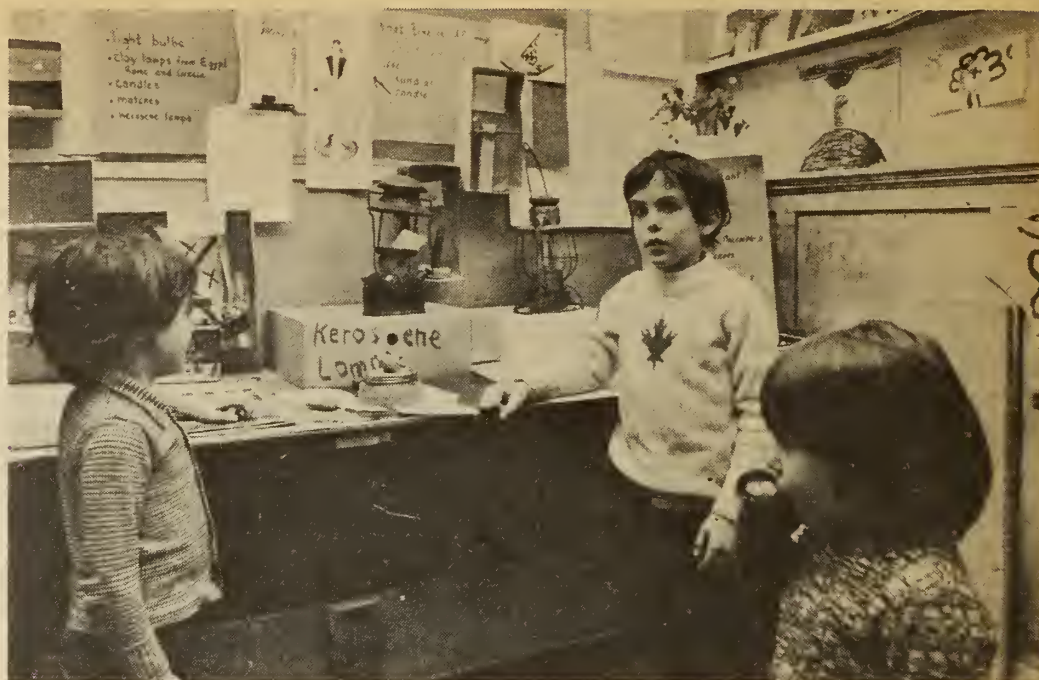
One experiment being tried this year in a small private school is the setting up of a school museum. This is by no means a new idea, but the practice of it, in this country at least, has been rare. The most important point in such a project is that the structure and much of the content must come from the school and the students – not from the staff or the community museum. There must be no attempt to re-create another museum in miniature. The activities that take place are aimed at getting the children to symbolize and objectify their own environmental experiences. This objectification enables them to be the originators of their own actions and thoughts, and thus responsible for them. (For the full exposition of this theme, see Paulo Freire's *Pedagogy of the Oppressed*.)

The 'digestive' theory of education, which presents students with facts, theories, and skills to be ingested and later tested, has absolutely no place in a school museum. There is nothing to be 'learned' – only an opportunity to act on one's environment and, reflectively, see how others have acted on theirs. This is real learning, real care-ful involvement.

As an activity taking place within the school environment, the school museum should help the children understand their experiences rather than merely exist in them. Bringing in the historical background adds depth in that it gives children actual physical contact not only with their own cultural history but also with that of people in other eras and other countries.

The method we used was very informal. We first designated an area in the school for use as a museum site. This could be divided into an activity area where actual objects could be made, an area with books and other literature on the themes, and an area for display purposes.

We went through the school explaining the idea of setting up a museum, first discussing what a museum was not –



objects in glass cages. Then we talked about our intention that it would be very much a local museum, with objects, ideas, and topics originating from the area the children lived in. For the first time only, a topic would be suggested by the staff and would be general throughout the school. From then on topics were to originate in the school and need not be general.

The first topic was a fairly broad theme – Light. On the next visit around the school this was broached, and individual projects were put forward. The subjects that were proposed ranged from Light Festivals (Christmas, Hanukkah, Dewali) to clay lamps, candle clocks, and atoms. Books and brochures on these subjects were then placed in the museum area, and shoeboxes were made available as display boxes.

Things began to happen. Children brought in 'light' objects from home – flashlights, kerosene lamps, light bulbs. In the school, candles were made and a candle clock constructed. One child built a miniature coal mine in a shoebox. Another painted two scenes, one showing the moon's reflection on water and the other the sun's.

This was then the time to start bringing in the past and other environments. A small Roman clay lamp was brought in from the local museum and passed around. Within the next few days, some children had made their own versions and gone around from classroom to classroom demonstrating them, using olive oil for fuel and shoelaces for wicks. This was also the time for museum visits, in very small groups, where the students

could see other objects on the same theme of Light. Finally, two films were brought in – one on an eclipse, and the other on a Japanese folk tale about light.

From our experience with our museum thus far, we think that a display of what the children have brought in and made should remain for a week or two, and then the next topics should be started. These next topics must originate with the children. They will most likely be a reaction to the first theme; for example, if the children were intrigued by the clay lamp, the next topics could very well range from Oil to Roman Times.

The three salient features of the school museum are these:

1. encouraging the children to try to symbolize their ideas,
2. tying in several environments – school, home, and community museum, and
3. allowing the children to take charge of their own reactions to their environment and to express them in words or concrete form.

It is actually a very simple project, particularly if carried out in a 'nonteaching' style. It is important to stress that there is no 'right' way to do something. If a child makes a flashlight by using a candle in a box with a hole in one end – that's it. The point is to set up the museum not as a teaching aid for right answers, but as a vehicle for concrete expression in an organized way – in a way that makes children aware of other people in other countries or other times, who have expressed themselves similarly by making objects and have left them behind for others to share.

Distractible Children in the Grade 1 Classroom

Solveiga Miezeitis
Department of Applied Psychology, OISE

During the winter of 1972/73 we conducted a project for grade 1 teachers who wanted to learn about different ways of handling distractible children in their classroom. Sixteen teachers from the Toronto, Scarborough, and York boards volunteered to take part in fifteen workshop sessions held at OISE. In addition to these meetings, we twice visited each teacher's classroom for half a day to observe the distractible children whom the teacher had referred to us and to offer direct consultation on working with these children in the classroom. We also made videotapes of pupil-teacher interaction, which were brought back to the workshops to serve as illustrative material for case discussions. Videotapes were particularly useful in demonstrating the effect of teacher strategies on pupil behavior and learning.

In order to get a clearer picture of the characteristics of distractible children, we tested all children in the classrooms involved on a variety of measures, while the teachers at the same time carried out their own assessments on three subjective rating measures. In addition, the testers assessed each child as to distractibility in the testing situation.

The results made clear that the children the teachers had referred differed significantly from the others on a number of school-related characteristics. The teachers rated them as less mature, more careless, less bright, less well organized, and slower to respond in class or to complete seatwork. On the tests these children's responses indicated greater impulsivity and poorer reading ability. Perhaps of greatest importance, on an Interpersonal Distance Measure they had placed themselves farther from the teacher, while on a parallel measure the teachers had placed themselves farther from these children.

It is evident that those identified as distractibles – an identification confirmed by the testers – were perceived less positively. We should not be surprised to find, then, that they performed less adequately and that they drew more negative self-perceptions and attitudes from the adults who came in contact with them in the school situation.

We should also note that these children constitute a fairly sizable group: between four and nine in each classroom, an average of six. And boys in the group by far outnumber girls.

The Distractible Child in the Classroom

How does a distractible child present himself to the teacher? What are his problems? What are the challenges the teacher must meet in working with him?

We observed each classroom on two occasions about three months apart. On each visit we spent the entire morning observing the distractible children during group lessons, small-group teaching, seatwork, activity time, gym, music, or other activities that occurred that day, as they related to their work, their peers, and their teacher. On the basis of these observations we formulated certain recommendations, which we discussed with the teacher during the lunch break. The teachers followed some or many of our suggestions and gave us feedback about their effectiveness. Our follow-up visit to the classrooms gave us an opportunity to observe the changes that had occurred in the children's behavior and also the ways in which the teachers had changed in order to bring this about.

Distractible behavior is a common symptom in children with academic and emotional difficulties. In our work with the ninety distractible first-graders we isolated six major types of problem where distractibility was a predominant symptom, and we experimented with a series of classroom suggestions for each. It is important to note that we worked with grade 1 children and our approach may not necessarily be appropriate with older children.

The implication is not that there are six 'pure' types of problem children. Rather, these are abstracted syndromes that can be selected by classroom observation. But since understanding the dynamics of these problems can help us to envisage treatment possibilities within the classroom setting, we built up descriptions of these six types of distractible children with case illustrations. Although some problem children will fit in one of the six types, others will be 'mixtures': for example, a basically immature and dependent child may also act out aggressively with his peers; an underchallenged child may also be depressed or may be an instigator

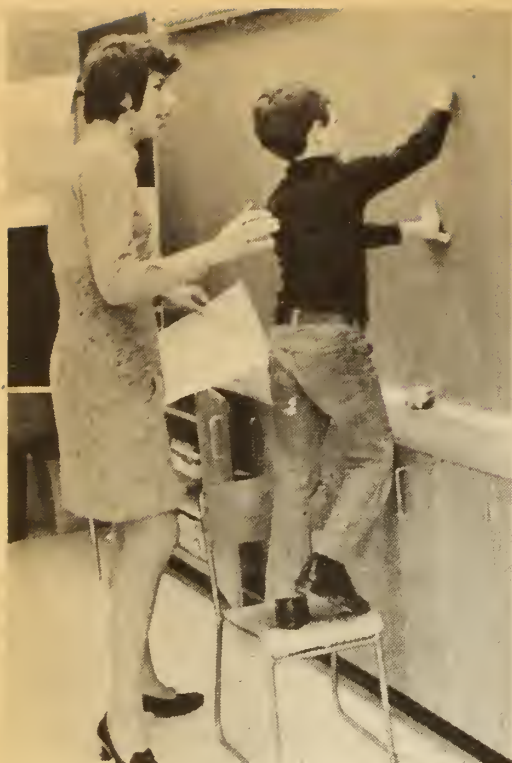
in his class; an overchallenged slow child may also suffer from rejection; and so on.

1. The Immature Dependent Child

A number of children arrive at school very much tied to mother's apron strings. They come unwillingly, frequently crying about having to leave mother. The mother is usually equally hesitant to leave her child, is anxious, and is overly solicitous. The child gets the message that mother is worried about leaving him in this new situation and hence feels even less secure about entering and exploring it.

Teachers recognize this pattern in kindergarten. They find that these children are usually less self-initiating, enterprising, and skilled than their peers. They are hesitant to explore new situations, hold back, cling to the teacher, and need a lot of help and care. They cry easily and withdraw shyly. They are afraid to tackle anything, are pushed around by others because they do not dare defend themselves, and are seen as 'babyish' or 'immature.'

This is typically an excessively dependent child who cannot let go of adult support and stand on his own feet. He typically comes from a home environment that is overly protective and overly solicitous and that discourages expressions of independence, self-assertiveness, and aggression. He got the message early on that only so long as he remains dependent and allows himself to be protected, to have things done for him and given to him, will he be loved and cared for. This illusion is maintained by his mother, who watches over and controls every step he takes and curbs any sign of aggression and initiative on his part. In this milieu, he builds up belief systems about how he has to act and how much he has to produce to remain in favor. To challenge, to take initiative, to act independently, and to change are perceived as aggressive acts that can only bring him anxiety and fear of rejection by the controlling adults. Because he is basically unsure whether he would be accepted if he were independent, his steps toward independence are tentative and fragile. In fact, he may only venture such steps in response to a demand expressed by the adults he depends on.



At school he is typically quiet and obedient, and he tries to please the teacher and get her to protect him. He experiences frustrations and has feelings of hostility, but he is unable to express them directly because expressing aggression is unacceptable in his value system. He overconforms instead. If he feels that he is not doing well or is not liked well enough by the teacher, or if he has aggressive feelings, he tries to make reparations. If the teacher does not respond to these because she is not aware of his anxiety or guilt feelings in the first place, he may become depressed. Depression results in decreased ability to work, feelings of unworthiness, poor self-esteem (which in turn leads to underachievement), apathy, crying (and hence ridicule by others), and inability to perform in social, play, or work situations.

The immature dependent child needs the consistent support of the teacher to be able to perform and grow in the school situation. It is important that she recognize his liabilities and the illusion he operates under – that any attempt on his part to cut the apron strings is a fearful risk. Since he is eager to comply, the teacher can program his activities in such a way that he assumes increasingly more self-initiative. While he ventures tentatively ahead, the teacher can stand by for support; but she should offer him ample recognition for his independent efforts rather than for his 'good child' behaviors the way his overprotective mother has done. The trick is to offer support, for otherwise the child experiences rejection, and to reward his attempts at self-initiative. The rewards could be other opportunities for further independent activity, rather than reminders that he has complied with the teacher's desires.

Eric was referred by the teacher as an immature, distractible child who rarely does any school work but likes to play in the sandbox. Eric is very dependent on the teacher for physical help in putting on his coat, tying his shoelaces, finding his pencil, and so on.

In group lessons Eric was wiggly and inattentive. When the teacher happened to notice that he was still and said, 'I like the way you sit and listen,' Eric seemed pleased. In his seat he tended to adopt a curled-up position with his head on his desk, half-heartedly trying to work at his assignment. He often stopped work and just lay curled up at his desk. He soon switched to coloring, although his work was incomplete. He had completed the first task correctly, but did not know how to tackle the second. When praised for the first and given help, he proceeded with the second. At one point Eric left his work and wandered over to another child in the sandbox and knocked over his production. The teacher took him back to the desk and helped him get back to work. Eric came to life when the teacher gave him some papers to hand out to the class. He did it efficiently and quickly.

It appeared that the teacher was helping Eric a lot on practical matters, but tended to have few academic expectations of him and left him on his own. He was getting very little attention, approval, or direction from the teacher on school work, but received a lot of positive contact when he regressed to more childish activities or failed to cope. Thus he was further reinforced for his immature behavior. The teacher reported that Eric's mother kept him home from school unnecessarily often, did not allow him to go on trips, and walked him to school long after he was able to come on his own. Eric had to drop out of the remedial reading program because of frequent absence. The teacher was discouraged and was giving up on him. He was isolated from his peers and directed back to his seat when he tried to make contacts. He responded in a compliant but dejected way.

The teacher agreed to give Eric more attention around school work, by breaking down tasks into smaller units, providing feedback and recognition at the completion of each unit, making brief but regular contacts to give him encouragement to maintain effort, and setting up sensible but definite work and behavioral expectations requiring greater self-reliance such as in dressing and keeping his things in order. Since Eric likes play materials, he could use blocks for counting, plasticene or sand for forming letters, and so on.

We discussed the possibility of reintegrating Eric in the remedial reading group and approaching the mother about sending him to school more regularly. It also seemed important to help Eric form friendships with his classmates to help him break away from mother and teacher as the only satisfying relationships.

The teacher carried through the recommendations with good success. On our second visit, Eric was participating in group lessons, sitting up and working attentively on seatwork, interacting with several children, and playing with more complex toys than earlier. He looked more mature and self-assertive, smiled spontaneously, and seemed much more aware of what was happening around him. His teacher reported that he was making good progress with his school work and attended school more regularly.

2. *The Rejected, Angry, Acting-Out Child*

Many children have experienced overt or covert rejection in their family situation and have developed the attitude that adults cannot be relied upon and trusted. Early on the rejected child has learned that he has to do things on his own, that he cannot rely on someone else to do them for him. This child will react to the teacher's approaches in an independent, aloof, and even suspicious manner, because he is afraid of being manipulated, used, and controlled by anyone who seems to come close. He cannot permit himself to trust and depend on an adult because he carries with him the 'illusion' that once he gives in to his need for dependency it will be used to manipulate him: 'If you do this for me, I will not reject you.' The threat that he feels of being trapped in a manipulative relationship brings forth anger on his part, and aggression becomes his tool for fighting off the environment. In order not to expose himself to this threat he denies his dependency feelings, maintains a stance of being able to look after himself, and remains suspicious and alert to any signs of people trying to get close to him and control him.

At school, he recognizes the presence of rules and perceives them as adult-made – another attempt to control him, to take his independence away from him, and to place him in a position where he will again be manipulated. Yet by his acting-out aggressive behavior designed to fight others off he achieves the opposite: he forces adults to try and control him continuously, and often he provokes them into harsh and inconsistent retaliatory behavior. Thus the child successfully continues to prove to himself the validity of his initial beliefs.

It is very difficult for the teacher to accept and empathize with the rejected child.

His behavior is often provocative and antisocial; he rejects well-meant warm and helping approaches; he is aloof and suspicious of any direct attempts at engaging him in a relationship, refuses to cooperate and comply with requirements, and is generally insensitive to others. He is so tied up with his own expectation of rejection and need to protect himself that it is very difficult for him to put himself into another person's position.

Not all rejected, acting-out children are as unreachable as this picture suggests. Some may be suspicious and cool to the teacher initially, but ready to accept and trust her if she maintains a consistent pattern of setting reasonable limits for behavior and offering recognition for positive shows of initiative. It is important to keep in mind that independence is very important to this child; thus the teacher can grant him more independence in work (such as a library project) and freedom in behavior as rewards for acceptable behavior on his part. Because of his tendency to perceive rules as adult control and manipulation, it is important to engage him in the rule-making process – then the rules are his rules, not someone else's to be fought. Once this child begins to experience a sense of power and control in exerting self-control, he will be able to turn his aggressive energies to constructive activities and learning. As long as he is in a power struggle with the teacher, learning is perceived as the teacher's requirement, not an activity that he wants to invest in for his own interest.

As the child becomes involved in constructive activities and gains recognition, he does not need to fight as hard, can allow greater closeness with his peers and teacher, and can begin to develop a sense of trust. One cannot expect overnight transformation of the rejected, aggressive child into a warm, sensitive, empathetic, easily approachable, easily conforming human being. However, the teacher may find that although limited in depth, her relationship to this child may be meaningful in developing his trust in people and allowing him to allow himself a more realistic degree of dependence.

On the other hand, there are rejected, acting-out children who have developed very extensive and devious defensive maneuvers and are very difficult to reach. One child may be extremely aggressive to peers and even adults – continuously poking, shoving, hitting, and trying to rule by terror; another may be suspicious of everything and everyone and translate every word the teacher utters into a special message with a double meaning.

Neither child is intrinsically interested in school work; each perceives work requirements as the teacher's weapon in the power struggle to subdue him. Rules are there to be fought and broken. The child can show extreme ingenuity in inventing ways of manipulating the teacher, out-smarting her, and sabotaging her plans. He can be the terror of his class, inciting trouble, bossing, resisting, manipulating, acting 'crazy.' He may be highly visible in acting-out behavior and thus command full attention all the time, or he may be running a 'secret' operation behind the scenes without the teacher being clearly aware of his influence as a master distracter. This child may show an erratic track record in his school work, being with it one day and refusing to do anything the next. He feels rejected and hostile, but rather than owning to his own feelings he seeks opportunities to project them on others and act out his hostility in retaliation to imagined provocation. He fantasizes that the other children provoke him, the teacher is too demanding, he is not appreciated. At the same time he does his best to provoke others into the rejecting attitude that he perceives to be there in the first place. For this child human interactions continue as a hurtful self-fulfilling prophecy.

Ron was referred to us by his teacher as a stubborn, uncooperative, withholding, distractible, negative, angry child who does not get involved in work and teases other children. She was aware that the child seemed unsure of himself and came from a rejecting home background. She saw him as rejecting her in her attempts to involve him either in group work or in a one-to-one situation.

We observed Ron in the classroom and found that he spent a lot of time gazing around the room, was generally uninvolved, and looked preoccupied, clenching his teeth and darting off defiant looks at the adults. He sat on the outside edge during group work but showed some hesitant signs of wanting to be involved – muttering answers under his breath, raising his hand and then pulling back, and withdrawing almost instantly if his mild attempts were not recognized by the teacher. He gave the impression of having a chip on his shoulder – he seemed to want attention and recognition but at the same time by withdrawing or misbehaving made sure that he would not get it.

We suggested that Ron be given recognition for show of cognitive involvement early in each group session. Since his academic ability was generally good the teacher also agreed to move him out of the low math group and offer him special recognition and encouragement in that situation. The teacher was willing to test

out our notion that Ron wants adult attention and recognition, but shuns it with an air of pseudo-independence because he lacks trust in adults. We discussed several possibilities for opening up a relationship with Ron, and the teacher decided to take some extra time to play some competitive games with him – checkers or table hockey – so that by having a chance to express his aggressive feelings in a safe game situation he would be able to approach her more freely.

The teacher carried out these suggestions. She also consulted with his mother, reporting to her that he was doing better at school, and she talked to the parents about the possibility of playing games with him in which they could allow him to win and thus safely express his anger and resentment. She developed a 'good manners' chart with her pupils where children were able to give each other stickers for friendly, helpful behavior toward another child. Ron felt comfortable with this relatively impersonal reward system. It did eventually bring him closer to his peers since he associated the stickers they gave him with their interest in him, and he reciprocated with greater interest in them.

The teacher reported greater involvement in school work, and marked improvement in mathematics. She found Ron to be less objectionable with other children, playing more with them, and he was approaching her more for work and social interaction. He stopped coming to school late, seemed happier, and developed a closer relationship with her in which he could ask for approval directly.

3. The Depressive Child

The depressive child has a strong need for acceptance and approval, and his self-image is highly sensitive to the acceptance of those on whom he depends. He is vulnerable to his own self-criticism and others' evaluation of him. He may become actively depressed in any of several circumstances: in a new or challenging situation where he feels that he is not doing well; in response to adult criticism, even though it is reasonable and well meant; or when he feels that the teacher is not interested in him and therefore, in his view, rejects him. The teacher may not be aware of anything special about a child for a long time until he comes to her attention because of poor school work and lack of motivation. He may appear apathetic and lacking in energy, slumping in his seat and dragging around without a smile or sign of enthusiasm about anything. The teacher may try to humor him out of his mood or challenge and encourage him to



work, but usually these efforts fail. He is not working well and is extremely aware of his failure and of letting the teacher down. The teacher's urgings for performance only serve to emphasize his lack of adequacy and result in further loss of self-esteem and ability to work. The teacher often sees his withdrawal as lack of effort, lack of motivation, laziness, or inability to grasp the material. She is frustrated because she cannot get through to this child although she senses that he has adequate learning ability since he has some 'good days.'

The teacher's frustration at not being able to control this child's productivity tends to make her react disapprovingly even when the child is making some effort. She is puzzled by him, for it is difficult to recognize the depth of this child's need to restore his faith in himself and his ability to do well. But the depressed child is very rewarding to work with once the teacher gets on to his problem. It may be necessary at first to offer recognition regularly for minute accomplishments to get the child started on work. Coming around to his desk frequently, patting him, and praising his even minimal attempts usually perks him up, and he throws himself into the task with renewed energy. He responds positively, although shyly and diffidently at first, at a friendly smile or a positive comment. Being able to relate to an accepting teacher is essential to his being able to invest his energies in work.

Peter behaves 'as though he were a nothing.' He conforms to the teacher's requests, but is generally so lethargic and bland that children ignore him and the teacher, an energetic woman herself, feels exasperated by this child who has no bounce and personality. She is particularly concerned because Peter seems to be regressing academically. He is slower than ever in his written work and spends a lot of time daydreaming. Peter has no friends, and lately he has been reported by other children for aggressive behavior in the yard. The teacher has never noticed this. In class, Peter tends to hover on the outside edge of the group; he appears shy and fearful of active play.

We observed Peter in the small reading group first. He sat on the outside edge of the group and answered correctly when his turn came. The teacher, although a consistently positive reinforcer, praised Peter only twice on five occasions when he answered. When she did reinforce him it was by repeating the correct answer and passing to the next child without making eye contact with him. Other children by comparison received extensive praise - 'Good for you!' 'That was a really hard one, John!' 'Look at how well David read!' Peter was the first to complete the written assignment, which the teacher glanced at casually and dismissed without comment. When the group broke up, Peter hovered around as though he wanted to approach the teacher, but he never made it. Other children talked to her and then all were sent back to their seats. Peter obediently went back first but David, an acting-out child, was praised for getting quickly to his seat. Peter sat down in a slouching position, worked with his cheek laid on his work, and did not turn his head back to watch a noisy snow-shoveling mime that the other reading group was putting on. After a while, as the activity became noisier, Peter glanced around, noticed that the rest of the class was enjoying the show, and watched, smiling quietly.

The teacher was not aware of Peter's intense conformity as an effort to please her and to get near her. She had also failed to notice that he had completed his written work first and had returned to his seat so promptly. She was surprised to hear that she had failed to praise him during the reading and admitted that much of the time she did not really notice him at all.

Once aware of her interaction with Peter, the teacher was able to alter it dramatically. She took note of his efforts and praised him, and she singled him out for special activities. Peter responded quickly and noticeably. He became visibly more self-assertive and spontaneous with his peers. He began to show an

enthusiastic involvement in work and play and visibly regained his self-esteem in response to the recognition the teacher was offering.

Other children sink much deeper in a depressive reaction and lose their ability to concentrate on work. They can be very difficult to reach unless the teacher moves first to restore their self-confidence.

4. *The Anxious, Fearful Child*

Some children are literally immobilized by the fear of making an error. They constantly expect to be punished and rejected. These children tend to be extremely meticulous and perfectionistic when they do tackle a task - they have to be absolutely sure and right. In his anxiety such a child will often block when asked a relatively simple question. The teacher may perceive this as lack of attentiveness because he may not be able to repeat the question that was asked. In seatwork he probably will not get started unless absolutely sure of the task, and yet he will be afraid to ask for help. Instead he may resort to copying - one way of avoiding self-initiative and the possibility of being wrong. Frequently he takes an unduly long time to complete his work, for he may erase and rewrite every word several times, recheck the addition facts on his fingers, keep repeating the answer to a reading comprehension question without ever getting to write it down. To the teacher he may appear to be wasting time and not settling down to his work.

When pressure is applied, if he does not block completely he may blurt out a totally erratic answer, for by giving up in this way he can at least escape his anxiety. It is a self-defeating practice, since the erratic response is wrong and the child experiences the failure he tried to avoid. Furthermore, the teacher tends to become exasperated by impulsive behavior and more demanding and critical.

Whether the child stalls and worries about being right, or takes an escape route from the tension he experiences, he can be helped considerably by a teacher who senses the nature of his fear. His tension can be diminished by her taking off pressure. For example, instead of presenting a task as a test and a potential failure situation - 'This is hard, so pay attention and make sure you get it right!' - she can emphasize that it is an exercise that will help him learn but not a matter of life and death. The child's fear reaction depends on the kinds of expectations and threats that he associates with any given situation. In a relaxed,

playful atmosphere he usually relaxes and responds better. The teacher can also be more relaxed and supportive once she stops perceiving the child's failure as her own failure in getting through to him.

The teacher described Bruce as a slow, perfectionistic worker who does not respond to her. Sometimes he appears disobedient, other times reserved. She cannot understand his problem or get through to him.

We observed Bruce extensively in class. Bruce holds himself stiffly, moves about minimally, and gives the impression of being scared. He shows intense involvement in tasks, always striving for perfection. When put on the spot by a question, he blocks and is unable to answer, although he will raise his hand at other times. He seems to get along with peers generally, but he became tense and bossy when paired off for a math assignment. Bruce was upset by the quality of his partner's contribution and wanted to bring it up to his standards of perfection.

The teacher interacted very little with her pupils on a one-to-one basis, and never casually. Her two comments to Bruce were both highly critical – he had made a small error, and he had failed to carry out her instructions perfectly. In group work, when he blocked she reprimanded him for not listening, and she ignored his later attempts to volunteer an answer by raising his hand.

We discussed the child's extreme anxiety about being right, his tendency to block when put on the spot, and his perfectionistic and slow work habits. Since Bruce is already self-critical to the point where it is interfering with a normal rate of work, it is unwise to criticize him. He needs positive approval of his work in order to be able to tackle it in a more relaxed manner. We also agreed that it is important to allow Bruce to answer when he volunteers, rather than putting him on the spot.

The teacher recognized Bruce's problem as related to anxiety over work and became much more responsive to his positive efforts. She offered him positive recognition instead of criticism, called on him to participate when he indicated readiness to do so, gave him more time to answer when he was slow, and chatted to him informally in non-work situations.

During follow-up, the teacher reported that Bruce is still tense over work and fairly slow at it, but he no longer blocks. He appears more confident with peers and the teacher, talks and moves more freely, and even acts silly at times.

5. The Overchallenged Child

Children frequently turn off from their school work because they experience it as too difficult. We accept and understand that a child will inevitably have problems with a task if he is generally slow in grasping new material. Frequently the slowness may be related to general intelligence and poor ability to take in abstract ideas, and such a child will often be overwhelmed by the complexity or abstractness of the work requirements. He easily becomes manifestly distractible when the material simply is too hard for him to cope with – not because he has any basic deficiency in ability to attend and concentrate. He needs simplified, concrete instructions that break the task down for him into a series of relatively easy steps, and he also needs more practice than the average child to master the work. When offered this kind of additional help, his distractible, 'not-with-it' behavior disappears and he can put forth the same kind of effort and persistence as the child of average ability.

On the other hand, slowness may be related to a more reflective learning style. The reflective child tends to take information in more slowly, think it through carefully, and then proceed at his own deliberate rate. This child needs to integrate each piece of information systematically to make sense of it, and typically takes longer to respond because of his tendency to think an answer through and check it out before verbalizing. He can become distracted when he feels too pressured by the speed at which demands are placed on him. If he is not allowed to process information at a comfortable rate, he tends to block and get confused. These characteristics can make him appear to the teacher as lacking in ability. But once she becomes aware of his style and allows him extra time, he frequently surprises her by the high quality of his work.

It is important to differentiate between the low-ability child and the reflective child since they have basically different potentials; while the former needs task simplification and lower demands, the latter just needs more time to process and to respond. Both, of course, need to receive recognition for their performance, but their achievements will not be the same. The danger is that the reflective child, in our speed-oriented society, can easily get trapped into believing that he is actually stupid and live up to that expectation, with resulting frustration, poor self-image, and academic underachievement.

Tom's teacher referred him to us as a 'strange' child. Tom takes a long time to get organized to start work, or even to choose an activity. He is quiet, remains isolated from his peers, and daydreams a lot. His printing is poor and he does not read well. His group IQ score is below average. Yet the teacher suspects that he may be brighter than he appears.

In class, Tom never budged from his seat, never smiled, never related to anyone. In gym he had real trouble finding a partner. He is slow, awkward, and poorly coordinated. With his pencil rigidly held he works laboriously. But during activity time he built intricate tower systems with blocks and chose and completed the most complex puzzles on the shelf. In math he was one of the few children in the class to complete correctly a difficult piece of seatwork. His conversation is slow, but well thought through. He has a good vocabulary and grasps concepts well.

We discussed Tom's behavior in terms of the slow, reflective style. When the teacher understood his need to take time to integrate information, she relaxed time pressures. She set up special situations to help Tom with his social contacts – asking him to be first to choose a partner, to help her hand out papers to the other children, and so on. She also lowered her expectations for his performance in printing.

On our second visit, the teacher reported that Tom's work was much better – he had become one of the best readers, he was helping other children, and he was doing his seatwork more quickly. Daydreaming was no longer a major problem. He interacted more with children, even aggressively at first, and had formed a close friendship with a new, very quiet girl.

6. The Underchallenged Child

The underchallenged child is often difficult for the teacher to recognize and accept because he tends not to conform. The intelligent conforming child is the apple of the teacher's eye. He does everything that is required of him and more. He is the teacher's proof that everything she offers and requires is good and reasonable. There are, however, children who are intelligent by IQ test standards and talented in special areas but in the classroom exhibit erratic performance and off-and-on motivation. They may be excellent readers and ignore everything except books, or they may have severe problems with reading but excel in math or oral language activities. They may write imaginative stories or produce intricate and ingenious art work but fail miserably in math and printing. Such children are particularly frustrating to the

teacher because of their up-and-down performance and uneven task involvement. Whereas they may be totally absorbed by one kind of assignment and complete it to perfection, they may flit about or act apathetic and bored on another. Eventually they fall behind in some aspects of their school work and become dejected or distracted when faced with such tasks. As demands increase and their failures become felt, lack of interest and poor performance may generalize to all school work. These children experience considerable conflict, because on the one hand they usually have experienced a sense of accomplishment and excellence in some areas of endeavor and yet are falling behind on tasks such as printing, simple number facts, and copying sentences from the board – tasks that may not be intellectually challenging or interesting to them.

The teacher experiences frustration because such a child shows potential but refuses to put forth needed effort. As a result she may focus only on his weaknesses, leaving his strengths and excellence often unrewarded because they are taken for granted as 'what comes to him easily.' He may even be penalized by being asked to give up his favorite activities as punishment for not completing work in other areas. The work he finds boring or difficult is made central in his school activity, and his areas of success are belittled and ignored. The child is thus left with a very bleak picture of his worth and adequacy in the school situation. All the emphasis is placed on his failures. Even his good will is questioned, for his successes are taken as evidence that his failures are due to 'not trying.' He responds to this rejection with bewilderment, anger, or apathy. He may withdraw his involvement from the situation, or he may clown around, escape into daydreaming, or engage in more intrinsically interesting activities on the sly. School becomes a rejecting and unchallenging enterprise because it does not offer him recognition, encouragement, and opportunity for the expression of his own contribution.

Mary is an intellectually superior six-year-old in a grade 1 & 2 class. (She reads at the grade 6 level.) She gets most work assignments completed quickly, though sometimes sloppily, but she does not volunteer to do any grade 2 work. She seems bored and dejected and tends to daydream. She does not have any close friends and is often left out.

When we observed Mary in the classroom, she finished her seat assignment quickly and asked the teacher permission to direct a puppet play. Her work was correct, but the teacher expressed some dissatisfaction with it. She spent most of the morning organizing the show. A couple of boys in the show started a fight, but Mary was able to steer them back to their roles. The show ended as the teacher called the children together for a 'show and tell' session. Mary had brought several items but was not given an opportunity to perform. The teacher commented that she knew that Mary could do this well and passed on to the next child. Mary was compliant but looked dejected and stared off into space.

Mary is the youngest in a grown-up family with three university-age siblings. She gets continuous intellectual stimulation at home but little opportunity for childlike play. Although the teacher is aware of this situation, she finds it hard to accept that Mary chooses to play instead of doing more school work. The teacher finds herself criticizing Mary a lot for her work, because it is often average rather than superior. She also tends to belittle Mary's use of her other talents as her way of wasting time or escaping from the serious business of work. The teacher is frustrated and disappointed that this bright child is not taking advantage of the combined grade 1 & 2 program open to her.

We talked about the classroom interactions that had triggered off a dejected response on Mary's part. The teacher recognized that because Mary was falling short of her expectations, she was not offering her recognition. Instead of pressing on with grade 2 work the teacher decided to challenge Mary's abilities in project areas and to allow her to interact more with her peers and take a leadership role with them in activities such as the puppet play. She would then be given recognition for this area of performance.

On our second visit, the teacher was pleased to report that not only had Mary completed a complex project, but she was also more alert in class and did her regular work with greater care and enthusiasm. The other children were including her more in their activities. The teacher was providing opportunities for Mary to express her talents, and Mary was responding much more positively to the whole school situation.

Classroom-Based Intervention

As the above case illustrations indicate, children who are initially distractible and turned off from school work can alter their behavior considerably in a matter of weeks once the teacher becomes

aware of the basis of their resistance. It is not always possible for the teacher to recognize the nature of the problem, for she herself is caught up in it; in their interaction her own expectations and goals seem somehow to be thwarted by the child. The teachers we worked with were invariably surprised by the information that emerged through our observations. The teacher is not in a position to keep constant track of thirty children, and her information on any one child's activities is limited and selective. Frequently a simple running account of the interaction sequences that we had observed provided sufficient new information for the teacher to begin to reassess the child and alter her interaction with him. The teachers felt that a perceptive, non-judgmental observer could be a very valuable resource in helping them understand problem children. In fact, some of them initiated exchange visits with their colleagues for this very purpose.

From an objective point of view, the classroom consultation venture was very successful. In most cases we recommended relatively simple direct classroom interventions that could be carried out by the teacher with minimal assistance. The interventions did not require extensive clinical work-ups, complicated changes in curriculum, or extensive work with the individual child. Minimal changes in classroom management procedures made a big difference. For example, having the teacher circulate in the class to take up seatwork as it is finished or to help those who need it, rather than asking children to line up one by one, had a major effect in increasing work-related teacher-pupil interactions and permitting the teacher to offer individualized help as it was required. Similarly, providing math seatwork at various levels of difficulty and abstraction to match different children's abilities reduced frustration and distractibility caused by boredom for some and by inability to cope for others.

Classroom-based interventions can make effective use of the teacher's strengths and involve her as a therapeutic change agent. The effectiveness of this procedure was evidenced by the teachers' reports of improvement in academic performance and classroom behavior for over 80 percent of the ninety pupils referred as distractibles.

Note: The author wishes to thank Mary Morris, Ph.D. candidate in School Psychology at OISE, who collaborated with her in the conducting of the workshops and in the teacher consultations.

Double O Zero

Universities across the continent awash in a democratic flood. Sandbags won't make it. Most of us, in our confrontations with students, are going under for the third time. But two of my colleagues at Dalhousie University have somehow inflated a life raft and may yet ride the democratic tide to a safe harbor.

Richard Bonine
Orbit 19

Yes Ollie Orbit there really is a final solution
or
Waves made by life raft oo Zero

Ten Rules for Drowning

1. Publish and/or
2. Perish.
3. Attend Conventions.
4. Initiate Conferences.
5. Defend Standards.
6. Invite 'Rep' Lecturers.
7. Be a 'Rep' Lecturer.
8. Milk the Academy's Golden Goose.
9. Institute Institutes.
10. Study Centers.

Our Solution is Survival.
It does work.

Two can teach 1000.
Students do learn

and
Come back for more History
(Send a stamped self-addressed
envelope and we will send the evidence.)
but -----
You need to:

1. Be willing to work,
2. five overtime hours a day,
3. six days a week,
4. eighteen months.
5. Produce ten VTR Cassettes.
6. Hustle unbudgeted money.
7. Avoid print freex.

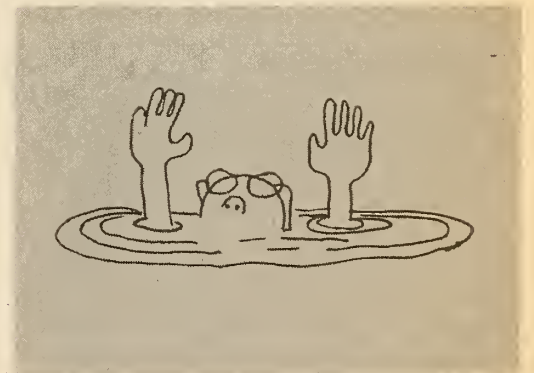
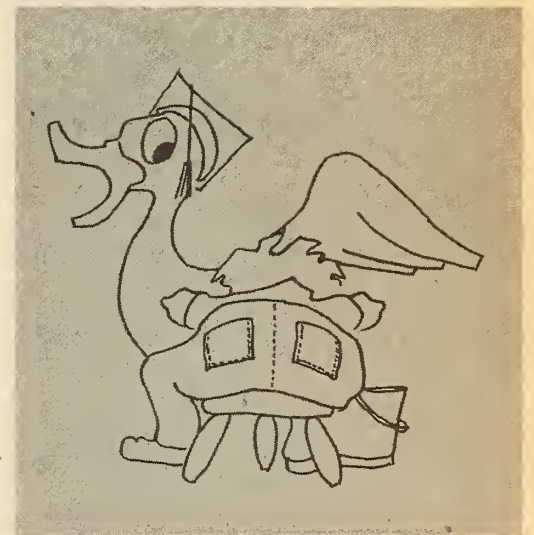
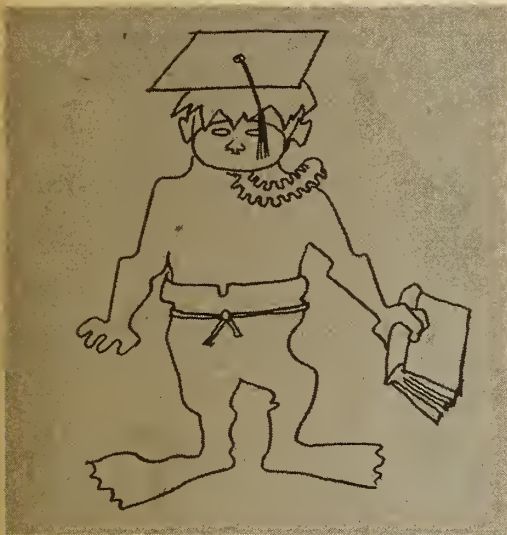
And if you are cooler than Billie Jean
and sassier than Bobby, you *might*
(with luck) pull it off for a year.

See you on Parnassus

John and David
Dal History
Halifax

The issue is this. Does the university, having admitted droves of poorly motivated, confused students, having enticed them to enter, and having received large sums of money from their taxpaying parents, have an obligation to provide an appropriate education? That's what Double O Zero is all about.

Richard Bonine
Orbit 19



Secondary School Students and Teachers Look at the Personal Side of Education

Richard Lonetto,
Department of Psychology,
University of Guelph

There seems to be one characteristic common to all the endless number of studies carried out at all levels of education from the primary grades to postgraduate training – the failure of these studies to take into account student and teacher perceptions of themselves, of their interpersonal interactions, and of their general experiences of education. Instead, the focus has been on 'performance.' Now, this doesn't sound as bad a state of affairs as it should. The real issue here is that the dynamic nature of student and teacher interactions has been severely neglected in all this striving to obtain measures of how students and teachers are 'behaving' and 'performing.'

Perhaps one of the best ways to view these studies is that they reflect the not very efficient traditional methods of social scientists; they aimed at exploring outcomes and not the complex processes of human beings that somehow result in those outcomes. This emphasis is changing (and slowly, I might add) through a realization that performance measures alone tell us very little about people. There is clear-cut need to obtain a much better understanding of the more personal aspects of education.

Consideration of this need led to a series of studies that began in 1972 and focused upon both student and teacher perceptions and satisfactions. The first study used eleven schools in Southern and Western Ontario, yielding a subject pool of 293 teachers and 6,152 students. (A second study, now in progress in the same eleven schools, is aimed at refining student and teacher perceptions of their interactions within a classroom setting and observing how these perceptions change over time.)

Students were asked to complete a Student Satisfaction and Perception Survey, which was designed to collect information relevant to rapport with teachers, rapport with other students, school experiences in general, perceptions of their teachers, and the like. The survey contained 15 'satisfaction' items and 77 'perception' items.



Photographs: John F. Ross

Similarly, teachers were asked to complete a Teacher Satisfaction and Perception Survey, which included questions dealing with rapport with students, rapport with other teachers, personal satisfactions with teaching, perceptions of teachers, work facilities, status, grading and evaluation, and the like. This survey contained 10 'satisfaction' items and 110 'perception' items.

Additional space to make comments was provided on surveys for both students and teachers.

Student and Teacher Satisfactions

Students
The most important aspects of student satisfaction, in terms of the items most often checked in the survey, were classified under four general headings.

I. Student-teacher relations. Under this category students showed concern with how students and teachers interact at school, how teachers treat students, the effects of teachers on student attitudes and values, the methods of teaching used, and student freedom to express opinions in class.

II. Student voice. Items under this category pertain to student voice in determining curriculum and school policy. This finding is not too unexpected in view of the changing role expectancies of our present student population from being passive bystanders to being participants in the decision-making processes at their schools.

III. Student-student relations. The items under this heading are related to student interactions with other students at school, and to school experiences in general.

IV. Realities of school. Noted in this category are student satisfactions with the curriculum offered at their school, with availability of school facilities, and with their grades.

Teachers

The most important aspects of teacher satisfaction were grouped under three general headings.

I. Being a teacher. The items found in this category include satisfaction with status as a teacher, relations in the community, teaching loads, and salary.

II. Teacher-student relations. This grouping of items refers to teachers' rapport with their students, personal accomplishments associated with teaching, and their perceptions of the caliber of students in their classes.

III. Rapport and resources. This category reflects satisfaction with the availability of school facilities, rapport with the principal, and rapport with other teachers.

The items most important to student and teacher satisfactions thus form a pattern of relationships that not only make a good deal of sense but overlap in an area 'rapport with each other.' It does seem that the nature of this rapport is seen by both groups as an essential ingredient in their satisfactions.

Naturally, teachers are also concerned about their status, teaching loads, and salaries, while students show concern about their participation in policy-making and school curriculum, and even in their grades.

The value of these findings is that they suggest student and teacher satisfactions are related to a combination of interpersonal, attitudinal, and practical aspects of education. Furthermore, they may lead us to the conclusion that limiting student-teacher interactions (for example, in after-school activities such as clubs, teams, and the like) would have more of a debilitating effect on student morale than limiting other school activities and resources.

Student and Teacher Perceptions *Students*

The items most frequently checked by students were grouped under six headings.

I. General perceptions of teachers and principal. Items noted for this category refer to teachers enjoying working with students, teachers deriving a great deal of personal satisfaction from teaching, teachers feeling successful in their role as teachers, and students having confidence in the abilities of their teachers. Also included in this category are student perceptions related to their principal, such as: our principal is a 'good guy,' our principal is interested in the problems of students and teachers, and teachers find it easy to talk to our principal.

II. General perceptions of teachers. The concern here is with teacher attitudes and teacher-teacher interactions. In particular, student perceptions were that teachers are more interested in students than in their salaries, teachers put to good use their education, abilities, and experience, teachers seem to be satisfied with their job, teachers at our school don't seem to do a good deal of arguing and feuding, and teachers at our school don't tend to take advantage of one another.

III. Perceptions of teacher-principal relations. Students perceived their principal and teachers as really getting along well. Students also felt that their principal appreciated the work of teachers and students.

IV. Perceptions of Canadian content. The perceptions most often mentioned were related to students wanting more Canadian content in their school's curriculum; however, just exactly what specific areas should be included was not mentioned.

V. Perceptions of teacher salary. Students felt that teachers were underpaid, while noting that teaching does pay enough for a satisfactory standard of living.

VI. Perceptions of school facilities. In contrast to what might have been expected, students seemed to feel that

their schools provided an adequate supply of classroom materials and audiovisual aids, and adequate library facilities.

Teachers

Six categories were needed to classify the most important teacher perceptions.

I. Perceptions of teacher-principal relations. Teachers reported that interactions with their principal tended to be positive and rewarding. Teachers also felt that their principal was understanding and easy to talk to, and promoted a sense of belonging between the administration, teachers, and students.

II. Perceptions of the positive personal aspects of teaching. The items in this category demonstrate that teachers derive a great deal of personal satisfaction from teaching, feel successful, enjoy working with students, and feel that students respect the work they are doing.

III. Perceptions of teacher-teacher relations. Items refer to teachers working and cooperating with each other, teacher interests related to both students and to salaries, the nature of disputes among teachers, and the formation of teacher cliques.

IV. Perceptions of peripheral teaching pressures. These include spending too much time doing clerical work, cutting through 'red tape' to obtain classroom materials, not having enough time to catch up on reading, and dealing with assorted community needs.

V. Perceptions of teacher salaries and roles. This category contains items related to teaching providing a satisfactory standard of living, the fairness of salary policies, teachers being well prepared for their job, teachers not participating in educational policy-making, and teachers showing initiative and creativity in their instructional methods.

VI. Perceptions of the negative personal aspects of teaching. This category illustrates another set of perceptions about teaching. Items include: students treating teachers with indifference, parents being more of a hindrance than a help in dealing with educational problems, students who come to school but not to learn anything, student behaviors irritating teachers, and not getting much satisfaction out of teaching anymore.

Students did show that they were aware of aspects of teacher and principal relationships, teacher salaries, the scope of Canadian content in their school's curriculum, and the availability and use of school facilities. The teachers showed that they gave thought to their inter-

actions with their principal, other teachers, and students, and to some of the pressures and personal sides of teaching.

It is very clear, in terms of both the 'satisfaction' and 'perception' categories, that students and teachers are concerned about the quality of their interpersonal contacts. Some outcomes we can draw from the present findings are that the highly satisfied teacher will try to have good relationships with students, other teachers, and school administrators. This teacher may place interpersonal communication above considerations of performance or may achieve a unique balance between them. The highly satisfied and perceptive student can be described as valuing his encounters with teachers and with other students. This type of student is more concerned with people than with performance.

Some Comments by Students and Teachers

Part of this study was devoted to examining comments made on the surveys by 1,500 students and 41 teachers. These comments were content-coded by four judges (including this author) along three major themes:

1. descriptions of the kind of teacher/student you would want to have contact with;
2. descriptions of the kind of teacher/student you would not want to have contact with; and
3. descriptions of the changes you would like to see in your school.

The student comments associated with each theme were further divided for grades 9 through 13 respectively.

Student Comments

Descriptions of the kind of teacher I would want to have:

Grade 9. The ideal teacher in the eyes of grade 9 students is helpful, is young, will not hassle them about morality or how to behave, can help them to understand the work presented in class, and has a sense of humor.

Grade 10. Students at this grade level feel that a teacher must be able to relate, accept, understand, and become involved with students. He must also know his area thoroughly, show no favorites, be helpful to and interested in students, have a sense of humor, and love his work.

Grade 11. Here is a similar picture to that in grade 10 with the additions that the teacher should promote student opinions and discussion, be honest, and be someone to talk to, someone who will listen.



Grade 12. This description is essentially that presented in grade 11. However, grade 12 students want a teacher to be able to control the class, be even tempered, and be friendly.

Grade 13. Students at this level stress those features already noted in grades 10 through 12, but place special emphasis on the teacher's encouraging their ideas and being considerate.

The change in these descriptions from grade 9 to grade 13 suggests that different teaching roles and strategies or even teacher personalities should complement such perceptual shifts. This development seems to be a bit on the unrealistic side, as it asks teachers to somehow bring to the class a sense of achievement orientation while at the same time humanizing their role as teachers. However, in the eyes of students these teaching attitudes and behaviors are not at all incompatible. This aside, these descriptions do reflect changing perceptions and perhaps needs as well, as students progress from grade 9 through grade 13. For example, grade 9 students do not place so much importance on teachers 'encouraging them' as do grade 13 students. Of further interest is the shift in grade 10 to describing as a most important attribute of teachers their ability to 'relate, accept, understand, and become involved with students.' This trait continues to be important for grades 11, 12, and 13.

Descriptions of the kind of teacher I would not want to have:

Grade 9. The 'worst teacher' a grade 9 student could face would combine in some way the following traits: bad tempered, old, crabby, will not listen, piles the work on, doesn't explain clearly the work presented in class, and embarrasses students in the classroom.

Grade 10. Students at this grade level describe such a teacher thus: shows favoritism, doesn't know the materials

being presented in class, is not interested in students, gives too many tests, boring, always right, and uses grades as a threat. The descriptions provided in grade 9 were also noted in grade 10.

Grades 11, 12, 13. Descriptions at these grade levels combined those provided at grades 9 and 10 with special emphasis on 'always being right and students being wrong' and not being able to explain clearly the materials being presented in class.

The pattern of descriptions provided here doesn't change as much between grade 9 and grade 13 as the pattern of desirable traits. However, in both patterns the areas of concern combine the practical and the interpersonal components of education. Again it should be emphasized that students tend to describe the type of teacher they would not want to have as not knowing his area, not presenting or explaining his subject clearly, and embarrassing or ridiculing students or otherwise putting them down.

It is amusing to note that the students provided a number of names of teachers in describing teachers they would not want to have, but supplied a significantly smaller number of names when asked to describe teachers they would want to have.

What changes would you like to see in your school?

Grade 9. More sports, longer lunch breaks, and (of course) a smoking lounge for students. But 'It's a pretty good school, you can't please everyone.' – (female student, aged 13, in grade 9).

Grade 10. Better school facilities, better school spirit, fewer exams, better food, more teacher and student interaction outside of class; and quite a few students felt that the school was fine the way it was.

Grade 11. A smoking lounge for students, better gym facilities, more student voice in determining school curriculum and policies, more student freedom to come and go to class, and more student participation in school affairs.

Grade 12. More student voice in determining school policies, more student and teacher discussions, fewer exams, better gym facilities, freedom to come and go to class, more student interactions with other students, and a smoking lounge of their own. 'There doesn't seem to be too much trust in the student. Every little thing we do is questioned and usually our rights are denied' – (male student, aged 16, in grade 12). 'This is my last year – if I thought of anything, I could probably never enjoy it.' – (male student, aged 17,

in grade 12). 'Smaller number of pupils in class.' – (female student, aged 18, in grade 13). 'I would like to see a mutual trust arise between the students and the administrators. . . . I feel this school exists for the benefit and convenience of the administration, not that the administration adds and assists the learning process by making things so organized.' – (male student, aged 16, in grade 12).

Grade 13. Less apathy, more teacher and student interaction outside of class, more student and student interaction, more preparation for the outside world, more informal dress for teachers, and fewer exams.

These suggested changes, especially those from grade 13 students, may shock the public with their overwhelming reasonableness. What happened to all those radicals? Students want to be treated as individuals and they are even offering to extend this treatment to their teachers!

Teacher Comments

Descriptions of the kind of student I would want to teach:

Teachers in answering the question tended to agree that such students should want to learn, be interested, motivated, and enthusiastic, be willing to share and express ideas and opinions, cooperate with the teacher and with other students, and be self-disciplined. Some teachers have added to the general list the following characteristics: courteous, well behaved, and an average student coming from a 'good home.' The descriptions seem to run along the same path as did student descriptions of the teacher they would want to have. That is, there is a tendency toward descriptions of 'super-teacher' and 'superstudent.'

Descriptions of the kind of student I would not want to teach:

In general teachers felt that 'no such animal exists' but did manage to add some character to this nonexistent being. Such students would be uninterested, coming to class only because they had to and in school even though they didn't want to be there. Also mentioned were students with mental or severe physical problems.

What changes you would like to see in your school?

Better facilities for classroom use, better staff relations and morale, less formal relationships with staff and students, less paper work, more extracurricular time, and more preparation time. The striking feature of these descriptions is that they are realistic and reasonable, and are directed toward positive educational change. 'The greatest need I feel is for better staff morale. I am really concerned about the pressure many staff members

are experiencing, and their resigned, I-don't-give-a-damn-anymore attitude. Five different people have said to me recently, and independently, "I just don't enjoy teaching anymore the way I used to." Without a love of teaching, kids suffer. I sometimes think we are like the animals in *Animal Farm*, unhappy, but too busy to sit down and pinpoint the sources of unhappiness, so like old Boxer we just keep turning the windmill.' – (comment by a female teacher who has been teaching for nine years).

Conclusions

The present studies have certainly conveyed the need to more fully consider student and teacher satisfactions and perceptions of various types of interpersonal relations (student-teacher, teacher-principal, teacher-teacher, and student-student) in any proposed assessment of the problems, needs, and quality of education at the secondary school level. The implication is that these satisfactions and perceptions must be examined completely before attempting to link them to teacher and student performance. For the present a good deal of additional work is necessary in order to more adequately define what is meant by their 'satisfactions' and 'perceptions.'

A study is now in progress to explore the following important sources of student satisfactions:

1. the quality and nature of student-teacher interactions,
2. student participation in decision-making,
3. student interactions with other students, and
4. student evaluations.

Both teachers and students are being asked to assess these four areas. The interesting aspect of this study is that assessments will be made at least twice during the school year. It is hoped that gathering information over a number of occasions will allow us to see which areas are changing over time and to examine the nature of this change. This work will be completed in June 1974.

A logical extension of this research in progress would be the use of similar instruments to monitor changes in the school system – in particular, the long-range effects of changing the home room structure, the increased student role in school affairs, and the effect of expanding the nature of student and teacher interactions.

Note:

Questionnaire materials and more technical information related to this work are available upon request. Please send all requests to Richard Lonetto, Department of Psychology, University of Guelph, Guelph, Ontario N1G 2W1.

COMINCO LTD.

Teaching Aids
from the
Community

Orbit is indebted to COMINCO LTD. for this review of technical films on lead and zinc. Those on lead were selected from the company's film library; those on zinc, from the library of the Zinc Institute Inc. The films are distributed by City Films Limited, Montreal, and are loaned free with outgoing postage paid. Requests should give alternate dates of showing and should be made as early as possible. (Processing takes a minimum of two weeks.) Please address requests to:

City Films Limited
4980 Buchan Street, # 301
Montreal, Quebec H4P 1S9

Lift Better Electrically (14 minutes, color)

A graphic demonstration of the advantages of vehicles powered by lead-acid batteries and their varied uses in commerce and industry. (Produced by Lead Industries Association)

Welding of Lead (20 minutes, black and white)

A training film designed to show the methods, equipment, and techniques used in 'burning' or welding lead sheet. (Produced by British Oxygen Company)

The Extraordinary World of Zinc (# 7873: 27 minutes, color)

A description of zinc, its uses, and how it affects our everyday life. The film shows how zinc is mined and smelted and examines galvanizing, die casting, and the common uses of die castings. The role of zinc in agriculture and in the making of such things as brass, paint, and rubber receives attention.

Hot-Dip Galvanizing after Fabrication (# 8258: 12 minutes, color)

The role of zinc in corrosion control and its application to steel by the hot-dip galvanizing process. The film explains the theory of electrochemical corrosion and illustrates the formation of galvanic cells.

La galvanisation à chaud (# 7869: 26 minutes, en couleur)

Ce documentaire de langue française illustre les différentes phases de la galvanisation et ses multiples applications dans la construction, l'agriculture, le transport, l'électricité et la navigation. Il nous montre la soudure à l'arc électrique de l'acier galvanisé, utilisée lors de la construction de l'édifice d'administration de l'aérogare d'Orly.

Une victoire sur la rouille
(# 7874: 20 minutes, en couleur)
La rouille s'attaque presque immédiatement aux surfaces d'acier exposées sans protection. Dans cette lutte contre la rouille, l'acier s'est montré un allié du zinc. Ce film produit en France, nous montre comment l'emploi du zinc métallisé en fil ou en poudre sur l'acier donne une couche imperméable. La métallisation peut être faite à l'usine dans des opérations automatisées, lorsque les pièces sont trop lourdes pour être transportées ou encore lorsque l'installation a déjà eu lieu. Nous participons à l'inspection d'une immense porte d'écluse installée il y a 38 ans et où pas une trace de corrosion existe. Nous pouvons voir différentes applications du zinc dans la construction, l'industrie et la navigation. L'importance de bien préparer la surface est aussi démontrée afin de permettre à la couche de zinc d'adhérer intégralement à la substance d'acier.

Le monde extraordinaire du zinc (# 8257: 27 minutes, en couleur)

La fonction du zinc dans notre monde moderne est montrée dans ce film sous ses différentes phases de l'extraction à la galvanisation pour être ensuite utilisé dans la fabrication d'utilités courantes. Nous pouvons voir le moulage sous pression, la façon de produire des instruments de haute précision à un rythme de 1000 à l'heure, le zinc galvanisé sur acier et son excellent pouvoir contre la corrosion. L'industrie de l'automobile l'utilise pour faire face aux rigueurs de nos hivers et pour prévenir la corrosion. D'autres formes d'alliage sont aussi montrées. L'utilité du zinc en agriculture comme fertilisant est aussi décrit. Finalement, son rôle dans la composition du caoutchouc et de matière plastique est présenté.

Lord Elgin High School

Profile of a School/24

Although many high schools pay lip service to such current trends as granting more freedom to students, individualizing instruction, and involving the community in the life of the school, Lord Elgin in Burlington is one of the few where it all seems to come together — and it works. Built on an open-plan design with a semestered form of organization, the school was opened in 1969 and has a present enrollment of over sixteen hundred students.

Many interrelated activities and organizational details contribute to the operation and success of the school. There is a semestered timetable that offers over two hundred courses in a fully composite setting. But as well as emphasizing the acquisition of knowledge and skills, Lord Elgin stresses the development of student attitudes and values — by allowing students of all ages considerable freedom in making their own decisions and by fostering strong links between students and staff. Ultimately, of course, it is the influence of the principal and staff that makes Lord Elgin something special. All staff members are dedicated to the school's operating philosophy, all of them take their professional responsibilities seriously, and among them there exists a strong sense of camaraderie.

Optional programs have an important place. There are many noncredit interest courses (mini-courses), and most ambitious of all is a program called 'the Bear Pit,' which functions throughout each school day and can embrace controversial lectures, films, field trips, and fashion shows in its myriad activities. It is open to students to come and go as they please and adds a new dimension to their school experience. We hope to publish a more detailed article about the Bear Pit in a future issue.

Residents of the community (and not simply parents) are involved in the school in several ways. For example, last year the number of adults taking regular daytime courses at the school reached a high of over a hundred. Adult enrollment is conditional on space being available, but the interaction of young people and adults in the classroom setting is actively encouraged. Many activities — particularly the Bear Pit — attract people to the school either as participants or spectators. And twice each semester (more often, perhaps, in the future) there are activity nights when the school operates as an organized drop-in center with offerings ranging from square dancing to ping-pong. In the other direction, many students are involved in community activities — for instance, this year over two hundred students are acting as part-time assistants in local elementary schools.

With new additions to the school building nearing completion, the enrollment at Lord Elgin will soon be over two thousand. There is presently some concern among Principal Paul Martindale and his staff that size could somehow diminish the school's dynamism. This they are determined not to let happen.



	Canada Post Postage paid	Postes Canada Port payé
Bulk third class		En nombre troisième classe
P403 Toronto		